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**Relativism in the linguistic representation and cognitive
conceptualisation of motion events across verb-framed and
satellite-framed languages**

Stéphanie Sandra Pourcel

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Thesis submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy in the University of Durham

Department of Linguistics and English Language
University of Durham

2005



16 JAN 2006

No part of this thesis has been previously submitted for a degree at the University of Durham or any other university.

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I wish to dedicate this thesis to the memory of Eleanor Price who has inspired me through the past seven years with her strength, courage, kindness and wisdom. The power of language ends here. To the big sister I never had..

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For Ellie.

ABSTRACT

The present doctoral thesis addresses the issue of the relation in human cognition between language and thinking, and, more specifically, it aims to investigate by scientific means the potential for a language-particular influence on cognitive activity and putative reflexes, i.e. the linguistic relativity question (c.f. Whorf 1956, Lucy 1992a).

To this end, the present thesis offers a detailed exploration of linguistic relativity and of its potential scope of validity – at least in theoretical terms. It further situates its study within modern cognitive science, whose epistemological approach to the study of the mind is multi-disciplinary, bringing the fields of psychology, linguistics and philosophy together for the enhanced pursuit of an understanding of human cognition.

Having established a conducive framework for the study of linguistic relativity within cognitive science and linguistics, the thesis offers to focus on a specific experiential domain of human life, and on its variable encoding in different languages to seek specific language influences over the conceptualisation of that domain. The chosen domain consists of MOTION – a pervasive domain in humans' daily lives and daily needs of expression. This domain is particularly interesting to relativistic studies as its conceptual components are lexicalised via differing means across the world's languages. Existing typologies for motion encoding (e.g. Talmy 1985) have established at least two main possible patterns, also known as verb- and satellite-framing, and as exemplified by the French and English languages respectively. The essential difference between the two language types consists of their grammatical encoding of the core element of motion, namely PATH – either in a verb or in a verbal satellite – and of their selective encoding of peripheral elements, such as MANNER of displacement – with this element being optional in French grammar, and obligatory in English.

The thesis offers empirical linguistic data to confirm – and also challenge – the fixedness of the patterns identified by e.g. Talmy. A thorough discussion of the linguistic framing of motion is presented, together with experiments bearing on the cognitive reality of motion conceptualisation – independently of language. This thesis thus contributes to an understanding of motion both in language and in cognition. Finally, it offers experimental work bearing on the relativity question, i.e. exploring whether linguistic patterns for motion encoding exert a decisive influence on the non-linguistic conceptualisation of motion, resulting in the two language communities differing in their cognitive appreciation of otherwise similar motion events. The final results offer evidence in favour of differing conceptualisations, that is, in support of linguistic relativity.

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CHAPTER 0. INTRODUCTION

The present thesis addresses the notion of relativism in the linguistic representation and cognitive conceptualisation of motion events in verb-framed and satellite-framed languages, with special attention to French and English. This volume thus entails the examination of a variety of topics – both theoretically and empirically. Relativism – the idea that symbolic systems influence cognition and, possibly, individual and societal worldviews – is a subject of active inquiry in philosophy, anthropology, as well as linguistics. On the other hand, conceptualisation is most specifically a central pole of study in psychology. Finally, motion is a topic examined in physics, psychology, and typological linguistics, among other fields. The present work attempts to reflect these diverse perspectives in order to attain a comprehensive overview and understanding of the dynamics of motion in language encoding and in cognition, with the underlying aim of resolving the relativity question with reference to this domain of experience.

The objectives of this doctoral research are thus multiple. First, it is hoped to contribute to a modern definition and understanding of linguistic relativity within the cognitive sciences. In this thesis, relativity – as fully detailed in Chapter 1 – is understood to argue that pervasive patterns of linguistic expression induce putative reflexes at the conceptual level. Eventually, the claim suggests that differing lexicalisation patterns, as found across languages, result in differing cognitive responses to the world. Relativity is consequently a controversial idea in the context of post-war universalist trends, both in psychology and in linguistics. Yet, having been neither fully proved nor disproved, its examination seems justified in the light of its considerable entailments for the nature of the human mind and of human societies. The importance of the subject is aptly demonstrated by current trends in the cognitive sciences – the overall field to which this work hopes to contribute.

A second set of objectives is to offer linguistic contributions to an enhanced understanding of motion expression in French and English. Existing typological and discursive frameworks have identified those two languages as lexicalising the domain of motion in divergent ways – either framing *PATH* – the core schema of motion – in verbs or in verbal satellites, thereby deriving the terminological distinction between verb- and satellite-framing languages. However, an increasing amount of linguistic data is currently challenging the typological formulae on offer, including data presented in this thesis – see Chapter 5. It is thus the aim of this thesis to demonstrate intra-language variability, question existing frameworks, and suggest a possible alternative model for understanding motion expression in the world's languages.



A third main objective is to contribute experimental findings bearing on the cross-linguistic conceptualisation of motion dynamics, independently of language. Two motivations drive this endeavour. Firstly, the aim is to attain an understanding of the potential universals in the human conceptualising of motion events, in order to identify the basic schemas at work in cognising the domain. A second aim is to apply this understanding so as to refine methodological procedures for the testing of relativistic effects stemming from language patterning, at a higher level of conceptualisation. In fulfilling this third set of aims, the thesis thus hopes to further contribute to methodological and epistemological considerations in the empirical investigation of linguistic relativity.

The present thesis is organised in three main sections to reflect those three main sets of objectives. Those three sections are further divided into eight content chapters.

The first section addresses the notion of linguistic relativity and thus launches the pervasive theme of the thesis. The section is divided into three chapters. Chapter 1 defines the relativity postulate. The chapter is theoretical and addresses critically the understanding of linguistic relativity to be adhered to in the present research. This understanding aims to espouse the original tenets outlined by the formal founders of the concept – namely Edward Sapir and Benjamin Lee Whorf. This chapter also defines an understanding of the levels of cognitive functioning under consideration. A full chapter is thus dedicated to defining linguistic relativity – an enterprise justified at once by the intrinsic complexity of the idea, the lack of agreement in modern academia concerning its claims, and the general underspecificity of Whorf's writings, in modern scientific terms.

Chapter 2 pursues this definitional endeavour from a historical perspective. For want of a holistic contextualisation of the understanding of relativity, its intellectual development over the past two and a half centuries is reviewed, with selective emphasis on pioneering figures and focal ideas. An overview of the ideas, methods, and results gathered around the topic is hoped to trigger the identification of the fundamental tenets and of the potential difficulties and traps involved in studying relativity. Past epistemologies should thus inform modern research efforts – of which this thesis is an example.

Chapter 3 aims to illustrate this very point by restoring the argumentative focus on modern-day understandings and approaches to the study of language and of relativity. By doing so, this chapter situates the present work within a specific epistemological framework, namely that of cognitive linguistics, whose emphasis is placed on the study of meaningful forms equally in language representations as in conceptual processes – assuming both to be interlinked. Upon such foundations, the chapter affords further specification of theoretical, epistemological, and

methodological issues in relativity. Modern relativity – also termed ‘neo-Whorfianism’ – is extensively discussed to conclude both this chapter and the first section.

The second main section in the thesis explores the topic of motion – the chosen experiential domain of reality in the present work. This transitory section between a theoretical understanding of linguistic relativity in the first section and its experimental application in the third section comprises two chapters.

Chapter 4 affords a cross-section transition by reviewing modern-day relativistic studies on the motion domain. This research review chapter presents four sets of studies – as deemed representative of the best research efforts in the field over the past decade. This chapter thus introduces the first pieces of data to be discussed in the thesis, as well as the first attempts at defining motion as a domain of reality and at characterising its typological properties across languages. In doing so, this chapter identifies the two main linguistic patterns for motion expression, namely verb- and satellite-framed, as exemplified by e.g. Romance and Germanic languages respectively. The chapter also outlines discrepancies in research findings, hypotheses, and overall methods; hence, concluding on the necessity for a more thorough understanding of motion properties, motion linguistics, and motion experimenting.

Chapter 5 aims at fulfilling those needs by undertaking a thorough and critical exploration – both theoretical and empirical – of motion as a domain and of its variable modelling in language. The chapter further offers some original linguistic data from English and French to illustrate the patterns so far identified in the literature. In doing so, it identifies gaps in existing research, and suggests a novel model for the description of motion in language. The chapter concludes with a revised set of possible relativistic predictions for the reliable testing of the ‘relationship question’ between language and cognition.

The third and final main section of the thesis combines the understanding reached in the previous two sections for the experimental study of linguistic relativity with reference to the motion domain. The section comprises three chapters, each representing one experimental set-up targeting one main cognitive function.

Chapter 6 presents early work on categorisation. Tests took one of two shapes – with and without language interference prior to cognitive performance on triads. Including the pilots, a count of 161 subjects were involved – equally distributed across native speakers of French and English. Results from these early tests prove inconclusive in terms of providing any relativistic evidence. In fact, findings are near-identical across language groups, though they differ from the findings reported in the studies reviewed in Chapter 4. However, responses show variable

consistency across groups relative to stimuli type. These findings are thus suggestive of universal conceptual dynamics relative to motion type, rather than to language.

Chapter 7 thus turns to an analytical and experimental exploration of those dynamics as independent of language. Based on the categorisation data, Chapter 7 identifies a number of schematic variables impacting on motion conceptualisation at a basic, universal level. The reliability of those variables is further tested via a conceptualisation-through-drawing task with a total of 44 participants, including native speakers of both French and English. Results were concordant with the new variable-based predictions, and further tests could then be devised to fine-grain experimental methods and stimuli for relativistic purposes.

Chapter 8 restores the testing focus on language-based conceptualisation therefore. This chapter presents tasks on memorisation of motion details using contextualised stimuli for recall and recognition performance. 47 native speakers of French and English performed the battery of tests. This final chapter outlines differing cognitive performance across language groups and thus offers preliminary evidence for relativity effects.

The thesis concludes by suggesting the need for thorough analyses and studies of (a) the relevant language patterns via data collection of actual language in use, (b) the chosen experiential domain via cognitive testing across language groups to ascertain universal and variable schemas operating in conceptualisation, and (c) the relativity question via the pertinent design of stimuli and hypotheses – based on (a) and (b) – the sufficient recruitment of subject samples, and the multiplicity of cognitive functions to be examined and tests to be implemented.

Thus overall, the thesis illustrates a study not only in linguistic relativity and motion, but also in methods in testing and analysing, and in epistemologies of study at a micro- and macro-level of investigation.

CHAPTER 1. THE LINGUISTIC RELATIVITY POSTULATE

This section provides an introductory description of linguistic relativity. The first part outlines the central tenets of linguistic relativity. The following section offers the formal definitions of linguistic relativity as presented by its modern founders, namely Edward Sapir and Benjamin Lee Whorf. A third section introduces the Sapir-Whorf hypothesis in its various versions; this section aims at clarifying the distinction between these versions and linguistic relativity. It will therefore comprise a discussion of linguistic determinism. Finally, the last part will examine the various basic levels of study which linguistic relativists may adopt in their examinations.

1.1. INTRODUCTION

Broadly speaking, linguistic relativity claims that language and cognition are interrelated, entailing that language has an active role in cognitive functioning. This role is typically characterised in terms of influence in modern revisions of the relativity postulate (e.g. Lucy 1992a: 1).¹ This school of thought focuses on the relativity of perceptions of the world that languages are potentially able to generate, and it asks whether languages have the power to create different realities out of the same world, so that native speakers of different tongues understand the world in different ways – and if so, it further asks how these perceptions and worldviews differ.

That grammars may exert a pervasive influence over cognition relies on a number of facts regarding the nature of language itself. A crucial preliminary aspect is that language belongs to tacit, or procedural, knowledge, and is therefore set below the threshold of awareness in cognition. In other words, the grammatical machinery of each and every language is highly systematic and hence not readily accessible to its albeit fluent speakers:

The obligatory phenomena within the apparently free flow of talk are so completely autocratic that speaker and listener are bound unconsciously as though in the grip of a law of nature. The phenomena of language are background phenomena, of which the talkers are unaware or, at the most, very dimly aware (Whorf 1956: 221).

Lay speakers' metalinguistic reflections are indeed largely restricted to ad hoc surface patterns, e.g. accents, lexical items, and the like. As such, the workings of language are abided by rather than pondered over and altered.

¹ Lee (e.g. 1996) has extensively criticised the modern interpretation of Whorf's linguistic relativity in terms of a language 'influence' on cognition as largely unjustified. However, the idea that language influences cognition will be equated with linguistic relativity in this thesis, as Whorf himself did talk explicitly of such an influence, also referred to as 'relation' (e.g. 1956: 134-59).

Furthermore, cognitively speaking, language involves complex processing. Languages are indeed highly complex systems of symbolic relations and referents enabling unlimited productivity. Fast and efficient cognitive processing of such complex stimuli is therefore likely to rely on neuronal connections and sub-structures developed as a result of the corresponding surface peculiarities of the local input system. Given the very early age at which humans acquire language skills, these connections may be formed whilst the brain is most plastic, hence causing a long-lasting cognitive architecture. In fact, infants start acquiring language long before their neuro-cognitive development and enculturation process are complete – showing that learning to speak is fundamentally part of being human.

Also worthy of note is the fact that not only is linguistic knowledge procedural and highly complex, but it is also accessed with very high frequency by individuals. Language represents the most widely used communication system in human societies – each individual averaging 20% of their waking day engaging in language behaviour. Since humans are a group species, it is evident that the frequency of such interactions serves to fulfil a more basic behavioural instinct, as indeed language mostly serves interactional purposes for social integration and negotiation (Dunbar 1996). This entails that language is both highly systematic and needed, and also that its surface specificities must be respected by each and every member of the group for its communicative purpose to be successful. Linguistic systems are therefore also shared social agreements.

The above assumption of a largely unquestioned acceptance of grammatical facts further leads to the argument that linguistic parameters and cultural artefacts may impose a constraining framework on speakers' minds, as one cannot but comply with the idiosyncratic patterns of the local language. This position relies on the previous point concerning the social nature of languages, as a lack of compliance to the local language would generate the failure of the communicative purpose of language. It also relies on the fact that languages around the world are established classificatory systems of that world. Languages categorise the world into semantic fields, partly based on conceptual universals, but also on ecological factors, such as climate, geography, technology, culture, and so on. At the most basic level of reference, languages categorise domains of experience via lexical items (e.g. colour, kinship, botany, anatomy); but languages also classify more complex or abstract relations via morphological and syntactic categories (e.g. tense, aspect, gender, number). In other words, languages tidy up the random bits of world experience into well-organised mental storage systems, so that:

Seeming to us no more than the glass through which we see our world, language is in fact the subtle, many-layered lens that created that world – the lens without which all that we know would dissolve into chaos (Bickerton 1990: 257).

This notion originally draws from Immanuel Kant's (1724-1804) rationalistic tenet according to which human minds, all alike, use an innate cognitive ability for categorising their 'raw' environment so as to impose order and significance upon an assumed pre-given, yet chaotic universe. For this reason, relativists have often been labelled 'neo-Kantians' (see section 2.1. below).

Though languages around the world are highly complex and thorough referential systems, it remains that in order to be efficient communicative devices, they can only afford to be partial representations of the world, as otherwise they would involve overly lengthy descriptions, redundancies, and endless sources of confusion. A perfectly comprehensive system of referential description can only be slow and eventually counterproductive. The efficiency of linguistic communication relies on the human cognitive ability for inference, as well as on the shared general knowledge that speakers have of the world and of language. Languages are therefore not thoroughly descriptive systems referring to each and every aspect of what is to be communicated; instead they select salient features of events and ideas for expression, leaving others unsaid altogether.

Languages are further patterned at the discursive level, so that the said and the unsaid are not juggled randomly in communication, but follow local preferences for features of communicative salience. These preferences give rise to discourse styles, or fashions of speaking. Styles of discourse are further affected by the relative codability of given domains of experience. Indeed each language has a finite set of lexical resources and morphosyntactic patterns at its disposal for reference to the world – if at least to enable their very learnability. Semantic meanings may therefore be more or less easy to encode in given languages, and hence the least codable elements may be left unsaid in typical discourse patterns. The ready codability of meanings may further entail the differential ease of cognitive access of the corresponding concepts:

In each language only a part of the complete concept that we have in mind is expressed, and each language has a peculiar tendency to select this or that aspect of the mental image which is conveyed by the expression of the thought (Boas 1966: 39).

A final point worthy of mention is the cultural and symbolic dimension of language. As arbitrary as language signs may be, they are irrefutably loaded with symbolic meanings and cultural affinities. Part of the complexity of linguistic reference lies in its multitude of connotations, denotations, registers, metaphorical images, semantic nuances, and so on.

Linguistic devices are rarely neutral and objective tools of reference to the world, which renders them difficult to translate systematically into one another without a certain degree of gain and/or loss of meaning:

Inasmuch as languages differ very widely in their systematisation of fundamental concepts, they tend to be only loosely equivalent to each other as symbolic devices and are, as a matter of fact, incommensurable in the sense in which two systems of points in a plane are, on the whole, incommensurable to each other if they are plotted out with reference to differing systems of co-ordinates (Sapir 1964: 128).

Languages around the world all display the above characteristics. They make use of procedural knowledge in systematic behaviour, and involve complex cognitive processing. They are used with high frequency in speakers' daily lives and are acquired early in infancy in parallel with physical, cognitive, neurological, and cultural development. They denote group activity and their internal patterns indicate a tacit social agreement among speakers of the same community. Languages are classificatory systems of the world at the lexical and morphosyntactic levels. They further encode domains of experience selectively and are partially referential only. These categories and their ready codability generate specific discursive patterns. And finally languages are highly symbolic and culturally loaded. Taking this much into consideration and considering eventually that languages diverge ever so greatly from one another in the referential means they use, it is suggested that speakers' compliance to specific linguistic systems is more than prone to condition the way language-users analyse and construe their local reality. The relativist perspective therefore implies that speakers of different languages differ putatively in their perception of the world, or *Weltanschauung*, as a result of the specific treatment offered by their native tongue to the lexicalisation of world domains of experience.

1.2. THE PRINCIPLE OF LINGUISTIC RELATIVITY

Linguistic relativity is most famously associated with the early 20th century American scholars Franz Boas (e.g. 1966), Edward Sapir (e.g. 1921, 1985), and Benjamin Lee Whorf (1956). For this reason, linguistic relativity is also often referred to in the literature as the 'Sapir-Whorf hypothesis' (see 1.3. below), the Boasian tradition, the Whorfian hypothesis, or simply Whorfianism. Whorf is considered the most central and insightful figure in linguistic relativity, which is often solely attributed to him. A discussion of linguistic relativity further entails a clarification of his claims, as the writings he was able to produce during his short life² are not

² Whorf died aged 44 after a long illness. It is also noteworthy that his interests in linguistics only started in 1924, as a 'hobby' outside his full-time employment as an engineer. He met Edward Sapir in 1928, but did not become Sapir's student before 1931, only ten years before his death.

only scarce, but also belong to a different academic era whose understanding of linguistic and psychological phenomena was obviously not the one we have today.

The principle of linguistic relativity was formally articulated in 1940 by Whorf (1956: 214):

We are thus introduced to a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar, or can in some way be calibrated.

Whorf (1956: 221) later made a less formal formulation of the principle of linguistic relativity:

Users of markedly different grammars are pointed by their grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers but must arrive at somewhat different views of the world.

In his terminological choice, Whorf found inspiration in Einstein's then contemporary theory of relativity, i.e. the premise that the speed of light is the only constant (or, independent variable) in the universe, and that everything else – including matter, mass, shape, time, and space – is relative to the point of standing reference.³ Of course, in Whorf's postulate, the focus is moved from the realm of physics to the domain of natural languages, so that, as Brown (1967: 10) explains:

there are establishable correlations between aspects of linguistic behaviour and various aspects of non-linguistic behaviour, with the added suggestion... that linguistic behaviour is in some sense the independent variable within a cultural context, upon which non-linguistic behaviour is dependent.

It is interesting that these very ideas were articulated by Einstein himself:

Thus we may conclude that the mental development of the individual, and his way of forming concepts, depend to a high degree upon language. This makes us realise to what extent the same language means the same mentality. In this sense, thinking and language are linked together (Einstein 1954: 336).

Mention of relativity was also already present in Sapir's writings (1985: 159):

The upshot of it all would be to make very real to us a kind of relativity that is generally hidden from us by our naïve acceptance of fixed habits of speech as guides to an objective understanding of the nature of experience. This is the relativity of concepts or, as it might be called, the relativity of the form of thought... For its understanding the comparative data of linguistics are a *sine qua non*. It is the appreciation of the relativity of the form of thought which results from linguistic study that is perhaps the most liberalising thing about it. What fetters the mind and benumbs the spirit is ever the dogged acceptance of absolutes.

³ For further discussion comparing Whorf's relativity with Einstein's relativity, see e.g. Alford (1981), Heynick (1983), and Lee (1994).

In fact, both Einsteinian and Jungian (i.e. psychological) relativity were specifically referred to by Sapir (e.g. 1985: 159). Whorf (1956: 66) too made explicit reference to Carl Jung (1923), when defining cognition and identifying linguistic loci of potential influence:

One of the clearest characterisation of thinking is that of Carl Jung, who distinguishes four basic psychic functions: sensation, feeling (*Gefühl*), thinking, and intuition. It is evident to a linguist that thinking, as defined by Jung, contains a large linguistic element of a strictly patterned nature, while feeling is mainly non-linguistic, though it may use the vehicle of language, albeit in a way quite different from thinking. Thinking may be said to be language's own ground, whereas feeling deals in feeling values which language indeed possesses but which lie rather on its borderland. These are Jung's two rational functions, and by contrast his two irrational functions, sensation and intuition, may fairly be termed non-linguistic. They are, it is true, involved in the processes of talking, hearing, and understanding, but only in an infinitesimal part of their entire range. We are thus able to distinguish thinking as the function which is to a large extent linguistic.

The crux here does not lie with the accuracy of Jung's understanding of psychology, but rather with Whorf's explicit position on his understanding of the mind. It is paramount to acknowledge that Whorf did not claim that language affects all aspects of cognition. Specifically, he recognised that sensory-motor perception – what he labelled 'sensation' and 'feeling' – and primary functions, or 'intuition,' are essentially non-linguistic. Instead the presence of language is identified at the level of conceptualisation, or 'thinking' – as previously advocated by Sapir (1985: 159). He further dismissed that *all* 'thinking' is linguistic (see also section 1.3.2.), e.g.

Silent thinking is basically not suppressed talking or inaudibly mumbled words or silent laryngeal agitations... Such an explanation merely appears plausible to the linguistically unsophisticated 'common sense' view (Whorf 1956: 66-7).

A discussion of Whorf's definitional ground for a language influence over cognition entails a discussion of Whorf's understanding of language (see section 2.2.3.). Whorf conceived of language as a meaning-making piece of engineering. In other words, grammatical structures are a means to semantic ends, for the essence of language does not lie in morpho-syntactic patterns but in their power to interlock thereby constructing meaning. This interlocking, or 'rapport,' as Whorf called it, constitutes the cementing of semantics:

Sense or meaning does not result from words or morphemes but from patterned relations between words or morphemes... It is not words mumbled, but RAPPORT between words, which enables them to work together at all to any semantic result (Whorf 1956: 67).

It appears that Whorf took semantics to be conceptualisation, or 'thinking' as he defined it. His loose use of the jargon may be confusing, yet his explanations make clear that he did not take all thinking to be semantic nor did he consider semantics to be linguistic as it were in the sense that words and morphemes are. Indeed semantics essentially lie in his idea of 'rapport' between words, and this is the part of cognition which he claimed was under the influence of language patterns:

It is this rapport that constitutes the real essence of thought insofar as it is linguistic (Whorf 1956: 67-8).

Sapir had also voiced a similar understanding of the 'thinking' influenced by language, i.e. language-based conceptualisation:

forms establish a definite relational feeling or attitude towards all possible contents of expression and, through them, towards all possible contents of experience, in so far, of course, as experience is capable of expression in linguistic terms (Sapir 1985: 153).

Taking the above understanding of cognition and 'thinking' – rather than a modern one – it may be claimed that the early relativity position is in fact much milder than has been understood in modern cognitive study (see section 1.3. below). For in Sapir's and Whorf's views, language is an integral part of cognition, and the 'thinking' that they refer to is essentially linguistic, or language-related. In short, language and cognition are intertwined as semantics is cognitive whilst being articulated by linguistic devices, i.e. words and morphemes. Semantics being largely determined by language means (or at least by rapports between them), it follows that a fair bulk of cognition is under the heavy influence of linguistic artefacts.

Whorf suggested that this is so to the extent that language patterns thinking at the micro- and at the macro-scale of conceptualisation, i.e. at the 'habitual thought' individual level of cognition and at the 'thought world' collective level, or worldview, respectively. Understanding speakers' worldviews through language was Whorf's ultimate goal of inquiry – well in accord with the anthropological endeavours of his times, which sought

to grasp the native's point of view, his relations to life, to realise *his* vision of *his* world (Malinowski 1922: 25).⁴

Whorf understood worldview as

the microcosm that each man carries about within himself, by which he measures and understands what he can of the macrocosm (Whorf 1956: 147).

Worldview thus refers to the subjective interpretation that each individual makes of the external world in order to find his/her place, role, and ontological meaning in it, and to bring it to his/her own level so as to understand it and adapt to it. Palmer (1996: 113-4) comprehensively defines worldview as referring

to the fundamental cognitive orientation of a society, a subgroup, or even an individual. It encompasses natural philosophy, fundamental existential and normative postulates or themes, values (often conflicting), emotions, and ethics; it includes conventional cognitive models of persons, spirits, and things in the world, and of sequences of actions and events; it includes social scenarios and situations, together with their affective values,

⁴ Sapir and Whorf would have been aware of Malinowski's work (though he was based in London), at least through his supplement article in Ogden & Richards (1923), which Sapir reviewed the following year – and following which, Joseph (1996) contends, Sapir's position on the influence of language upon thought was greatly altered, in a more conclusive direction.

contingencies, and feeling states. It includes, as well, the metaphorical and metonymical structuring of thought... In short, a worldview has all the complexity of life itself.

It is important to note that for all his alleged vagueness, Whorf further specified that worldviews are not completely fashioned by languages. Like Palmer (1996), Whorf acknowledged the central role of culture, so that

By 'habitual thought' and 'thought world' I mean more than simply language, i.e. than the linguistic patterns themselves. I include all the analogical and suggestive value of the patterns, and all the give-and-take between language and the culture as a whole, wherein is a vast amount that is not linguistic but yet shows the shaping influence of language (Whorf 1956: 147).

Whorf was essentially a student of life, before being a student of language. Like Sapir, Boas, and Malinowski, he was interested in man's vision and understanding of the world (see also section 2.2.). Like them too, he departed from the fact that humans live in societies articulated by cultural systems in which language figures centrally as a symbolic objectifier of local meanings and relations between individuals, society and the outer world they inhabit. He certainly did not claim that language was the absolute central control of all human thought, but his focus on linguistic systems led him to appreciate the breadth of psychological scope that language could reach. Though he agreed that language was a mirroring part of culture, he also perceived that language further maintains the system as it is, through its provision of a collective, symbolic, yet idiosyncratic tool whose complexity is hardly perceived by the individual mind, but whose rules must be abided by from the youngest of ages for the unavoidable purpose of social interactions:

Every language is a vast pattern-system, different from others, in which are culturally ordained the forms and categories by which the personality not only communicates, but also analyses nature, notices or neglects types of relationship and phenomena, channels his reasoning, and builds the house of his consciousness (Whorf 1956: 252).

1.3. THE SAPIR-WHORF HYPOTHESIS

1.3.1. RE-FORMULATION & MISUNDERSTANDINGS

The expression 'the Sapir-Whorf hypothesis' first appeared officially in Hoijer (1954) (Koerner 2000: 1). It is crucial to establish the distinctions between this hypothesis and its various forms from the above tenets as held by the originators of linguistic relativity, namely Sapir and Whorf, as much academic confusion has indeed been caused over the years by a very lack of terminological clarity. As Black (1969: 30) remarks,⁵

⁵ See also Lakoff (1987: 306-37) for an extensive discussion of the variability in conceptions of relativism.

an enterprising PhD candidate would have no trouble in producing at least 108 versions of Whorfianism.

The Sapir-Whorf hypothesis was therefore born in the 1950s, that is, more than ten years after the deaths of Sapir and Whorf, and even Boas.⁶ It proved a reformulation not only of the formal principle of relativity articulated by Whorf, but also of the overall ideas put forward by both Sapir and Whorf. In fact, post-war research into linguistic relativity rarely ever took Whorf's principle as its starting point, and his statements have been more often than not ignored and therefore distorted (Lee 2000: 43). As Grace (1987: 5) comments, academia in the 1950s and 60s seemed to assume

that what Whorf was actually proposing was some kind of *hypothesis* about a relation between language and perception (or world view, or thought, or culture), but that he had given no clear formulation of this supposed hypothesis and that no one else has been able to do so either. That is, no one else has been able to figure out how to formulate it so that it can be tested. As a consequence, it is in terms of hypothesis formulation and testing that Whorfianism is now conventionally discussed.

Indeed, the most characteristic change to linguistic relativity witnessed by post-war research resides in Whorf's principle no longer being considered an aim of anthropological linguistics, or simply a valid axiom of study. Instead, linguistic relativity shifted from being a research tradition to being a questionable hypothesis for empirical testing and theoretical validation. This shift struck an obvious blow to the foundations of the relativist enterprise. Linguistic relativity subsequently lost much of its credibility in the eyes of post-war scientists, and to this day, fifty years on, relativists remain marginalised, viewed by many as credulous and somewhat romantically naïve (e.g. Pinker 1994: 57-67, 404-27). In fact, as Lee (1996: 19-20) rightly highlights, linguistic relativists, and Whorf in particular, are often misquoted and criticised without argumentative support – possibly the most contemptful way to insult in academia, e.g.

The thing is: I *hate* relativism. I hate relativism more than I hate anything else, excepting, maybe, fibreglass powerboats. More to the point, I think that relativism is very probably false. What it overlooks, to put it briefly and crudely, is the fixed structure of human nature (Fodor 1985: 5).

Though Whorf and his predecessors focused on the study of linguistic and cultural diversity and therefore left the discussion of the 'fixed structure of human nature' to the confines of footnotes, it is rather crucial to correct Fodor's representative misunderstanding of relativists' conception of universals. Let it not be forgotten that one of Franz Boas's main endeavours was to promote the very idea of 'the psychic unity of mankind' – obviously stressing human universals, on the basis of his cross-linguistic and cross-cultural data:

⁶ Sapir died in 1939, Whorf in 1941, and Boas in 1942.

It is well worth while... to seek in the peculiarities of the groupings of ideas in different languages an important characteristic in the history of the mental development of the various branches of mankind. From this point of view, the occurrence of the most fundamental grammatical concepts in all languages must be considered as proof of the unity of fundamental psychological processes (Boas 1966: 67).

His student and follower, Edward Sapir was equally keen to acknowledge the presence of universals both in human cognition and in natural languages, as he posits a

distinction between essential or unavoidable relational concepts and the dispensable type... The former are universally expressed, the latter are but sparsely developed in some languages, elaborated with a bewildering exuberance in others (Sapir 1921: 94).

This distinction shows Sapir's recognition of concepts obligatorily used in language (he exemplified these with notions such as agency, causality, etc.). The point remains, nonetheless, that the whole relativistic enterprise is bound to interest itself in the 'dispensable type', as expressed selectively by differing languages, and as therefore possibly conceptualised differently – albeit greatly or subtly. Sapir made this point explicit, as he insisted that cross-linguistic study is paramount to any linguistic enterprise, be it relativistic or universalist:

All forms of linguistic expression are reducible to a common psychological ground, but this ground cannot be properly understood without the perspective gained from a sympathetic study of the forms themselves (Sapir & Swadesh 1964: 101).

Finally, Whorf too discussed the universal nature of grammar:

In linguistic and mental phenomena, significant behaviour... are ruled by a specific system or organisation, a 'geometry' of form principles characteristic of each language... And now appears a great fact of human brotherhood – that human beings are all alike in this respect. So far as we can judge from the systematics of language, the higher mind or 'unconscious' of a Papuan headhunter can mathematise quite as well as that of Einstein (Whorf 1956: 257).

Whorf distinguished two types of universals relevant to his investigation of the linguistic relativity principle. The first is that of 'isolates of experience,' or domains of experience, which refer to the outer 'objective' world, the same for all human observers; and the second, more interesting, type being that of language universals. Though the discussion is neither explicit nor thorough – in a descriptive universal grammar textbook sense – in 1938, Whorf provided a language framework of analysis entitled 'Language: Plan and Conception of Arrangement,' detailing all the elements to be found in language (1956: 125-33). This framework was aimed as an etic grid for linguistic documentation fieldwork on *any* language, and thus assumed that all the elements detailed in those few pages correspond to universals of the language phenomenon. Whorf further believed that the cross-linguistic study of the world's languages was an urgent enterprise, in order to evaluate the nature of universals across languages, as linked to human cognition – an endeavour echoing modern, Chomskyan aims:

The tremendous importance of language cannot, in my opinion, be taken to mean necessarily that nothing is back of it of the nature of what has traditionally been called 'mind'. My own studies suggest, to me, that language, for all its kingly role, is in some sense a superficial embroidery upon deeper processes of consciousness, which are necessary before any communication, signalling, or symbolism whatsoever can occur.

... it may even be in the cards that there is no such thing as 'Language' (with a capital L) at all! The statement that 'thinking is a matter of LANGUAGE' is an incorrect generalisation of the more nearly correct idea that 'thinking is a matter of different tongues'. The different tongues are the real phenomena and may generalise down not to any such universal as 'Language,' but to something better-called 'sublinguistic' or 'superlinguistic' – and NOT ALTOGETHER unlike, even if much unlike, what we now call 'mental'. This generalisation would not diminish, but would rather increase, the importance of intertongue study for investigation of this realm of truth (Whorf 1956: 239).

In the face of the myriad of examples of references to and assumptions of universals, Whorf's critics seem to have been either blind or unread. In their eyes, Whorf's greatest mistake seems to reside in the fact that he never developed an explicit theory of universals. The point, however, is a simple one: such was not his aim. Clearly, Whorf did hold a fundamental belief in universals. Such a belief by no means discredits the potential validity of relativistic endeavours.

1.3.2. STRONG & WEAK VERSIONS

The reformulation of linguistic relativity further entailed the lumping together of Sapir and Whorf in a rather naïve fashion, so that all their ideas and writings were conflated into two simple questions:

- (a) does language *influence* individual cognition (i.e. thought) and social cognition (i.e. worldview)?
- (b) does language *determine* individual cognition (i.e. thought) and social cognition (i.e. worldview)?

(a) refers to the so-called 'weak version' of the so-called Sapir-Whorf hypothesis, whereas (b) refers to its so-called 'strong version.' The distinction is one of extent as regards the pervasiveness of language effects on cognition. The weaker claim is a fairer, albeit simplified, understanding of Sapir's and Whorf's ideas, and is often taken to be synonymous with linguistic relativity. The stronger claim, on the other hand, entails that language more or less dictates the content of thoughts, and that thinking would be impossible without language. This extreme position is also referred to as linguistic determinism.

Linguistic determinism is suffused with fundamental flaws, as it entails that words and thoughts are one and the same thing. Put differently, there are no thoughts unless there are the words to express them with. The first obvious objection relates to thinking tasks not requiring language, e.g. map-reading, washing-up, and the like; and also to the anecdotal reality that all

thoughts are not always readily encodable in language, e.g. emotions. In other words, cognitive activity does not have to be linguistic to function. In more general terms, if this were the case, language acquisitionists would face a chicken-and-egg dilemma in explaining how children develop language in their first years of life. Likewise, language evolutionists would be none the wiser in their exploration of the phylogenetic course of language. Possibly, one would have to resort in despair to divine theories of evolution, which remain scientifically unsatisfactory. An additional problem concerns language change, and the simple coining of new expressions. Furthermore, one would face quite an ontological trauma in learning a foreign language. In fact, a deterministic view would predict that such a feat would be impossible, just as cross-linguistic understanding and the art of translation would remain beyond the reach of speakers of different tongues. With respects to these few, yet fundamental, hurdles, we may safely reject the very possibility of any form of linguistic determinism in the absolute – thereby agreeing with Pinker (1994: 57) that

The idea that thought is the same thing as language is an example of what can be called a conventional absurdity.

It is insightful at this stage to consider the writings of Whorf himself on this topic. It must be noted that he never supported a deterministic influence of language over thinking:

Some have supposed thinking to be entirely linguistic. Watson, I believe, holds or held this view, and the great merit of Watson in this regard is that he was one of the first to point out and teach the very large and unrecognised linguistic element in silent thinking. His error lies in going the whole hog (Whorf 1956: 66 ft.2).⁷

There are a number of issues overall with both weak and strong versions still, as the reformulation fails to establish what is meant by both language and cognition. The hypothesis therefore remains vague and its aim of investigation unclear. In fact, in isolation, these questions appear altogether naïve – if not childish! This basic problem stems from the above-mentioned ignorance of Sapir's and Whorf's writings, and it is aptly illustrated in the myriad of post-war epistemological and methodological directions followed – and errors generated (see section 2.3.) (Lucy 1992a).

The present thesis will attempt to remain faithful to Whorf's original principle. It will assume that, aside from empirical considerations, Whorf's arguments are valid both in form and content. In the light of the accumulated evidence over the past decades – yet to be reviewed (see following chapters) – I suggest that, if not then, at least today, linguistic relativity no longer deserves the status of hypothesis, nor any misleading labelling. As such, I will consistently

⁷ Whorf was referring to psychologist John B. Watson (1878-1958).

adopt the phrase ‘linguistic relativity’ to refer to Whorf’s position, whose ideas remain the most inspirational to the present work. ‘Linguistic determinism’ and the ‘Sapir-Whorf hypothesis’ will be understood as they have been described in the above paragraphs. In brief, the expressions will not be used interchangeably.

1.4. LEVELS OF COGNITIVE EFFECTS

Sapir and Whorf, themselves, were often vague as to what kinds of specific effects on cognition language may be expected to exert, referring to language as being “a power of thought” (Whorf 1956: 244), “a shaper of ideas” (ibid. 212), “the real essence of thinking insofar as it is linguistic” (ibid. 67-8), “a particular *how* of thought” (Sapir 1921: 218), or again “a symbolic guide to culture” (Sapir 1985: 162).

This looseness of definitional precision is not so much a problem per se, as it is representative of the potential variability in levels of cognitive functioning that language patterns, or possibly *Language*, may trigger. Whorf, at least, seems to have believed that language effects could be observed (a) at a universal level as derived from the very use of a highly complex, symbolic system, so that the human ‘intellect’ could be enhanced by linguistic systems, (b) at a pervasive level of unconscious, systematic thought, whereby the experiential features selected by native linguistic categories as salient would naturally become cognitively salient as a result, and (c) at a functional level of collective cognition whereby established ‘fashions of speaking’ yield cognitive preferences and cultural inclinations. For the sake of analytical rigour and argumentative clarity, these three levels of cognitive effects will be distinguished in detail below.

1.4.1. THE HYPOTHESIS OF SEMIOTIC RELATIVITY

As suggested by Whorf, language is likely to increase cognitive potential:

The mantric formula-language is specialised... in order to make available a different type of force manifestation, by repatterning states in the nervous system... Those parts of the organism, until such strategic patterning has been effected, are merely ‘innocent gadgets’, incapable of dynamic power...but IN THE PROPER PATTERN they are something else again – not to be understood from the properties of the unpatterned parts, and able to amplify and activate latent forces (1956: 250).

Having a semiotic system of communication as offered by human language may in itself be assumed to impact on cognitive abilities. In Lucy’s words (1996: 38-9), the hypothesis of a semiotic level of linguistic relativity points out that

in the human case, it is important to ask whether the use of the semiotic form we call language in and of itself fundamentally alters the vision of the world held by humans in contrast to other species.

It may indeed be argued that such a complex symbolic system may create general neural pathways inter-wiring language-related cognition and general cognitive processes, so that language might enhance memory, learning, attention, abstract thought or mental computation of various kinds:

Because words have symbolic properties, because their usage is patterned with reference to the total environment, language can cause a cognitive structure (Brown & Lenneberg 1954: 457).

Experimental work has shown that this may indeed be the case – see e.g. Tyler & Spivey (2001) on how spoken language improves the efficiency of visual search; Goldstone (1994) on how linguistic categorisation influences perceptual discrimination; Levinson (2003) on how absolute linguistic frames of reference enable systematic cognitive computing of absolute coordinates in space; Gentner (2003) on how relational language enables children to form non-linguistic relational representations.

Such a position would claim that language impacts on overall perception at the species level, so that human and animal cognition differ fundamentally due to language – among other factors. Contrastive experiments on ‘normal’ chimps and language-trained chimps has indeed reported improved performance on matching tasks by the languaging chimps (Clark 1998; Thompson, Oden & Boysen 1997). Numerous studies report further effects of symbol enculturation and usage on animal cognition, including studies on apes, dolphins, parrots, pigeons, dogs, turtles, hummingbirds, honeybees or even octopuses (see Kuczaj & Hendry 2003 for a review). This position would further entail that human cognition would be affected in cases when language acquisition follows an abnormal course of development, especially when a child is deprived of language input altogether. This general view is echoed by Györi (2000: 74):

Language makes human cognition symbolic and thus qualitatively different from other types of cognition.

This view departs from theories viewing language in a purely biological light, as a form of genetic endowment organised as an independent language-specific set of modules in the brain – an approach fully concordant with the views held by Whorf and Sapir:

an unconscious control of very complicated configurations or formal sets is individually acquired by processes which it is the business of the psychologist to try to understand... these forms lie entirely outside the inherited biological tendencies of the race and can be explained only in strictly social terms (Sapir 1985: 555).

the linguistic aspect of thinking is not a biologically organised process, “speech” or “language,” but a cultural organisation, i.e. *a* language (Whorf 1956: 66 ff 2).

Instead, it stresses the necessity of collective agreement for the use and maintenance of symbol systems, thereby justifying the very essence of language on the basis of the human need for

social interactions (Lee 1996: 30). Indeed, to allow for the stabilisation of essentially non-natural symbols, symbol-users must comply with the rules of use in place. This means that any shared symbolic system entails conventionalisation. As regards systems in ongoing use – such as language – conventions are not so much agreed upon as followed. Hence, the social conventionality of language makes it pervasive in all dimensions of individual lives – and individual minds – as it

allows language to be a medium for the socialisation or objectification of individual activities – including thought (Lucy 1996: 40).

Such a view therefore suggests that language serves as a functional tool for both social and individual cognition (Györi 2000). The ultimate claim being that the use of a language capacity turns humans into a systematically symbolic species. In other words, language impacts on cognition across all members of the species in a fundamental universal fashion – mainly for adaptive purposes.

1.4.2. THE HYPOTHESIS OF STRUCTURAL RELATIVITY

Language effects on cognition may be yet more specific than the ones reviewed above. At the structural level, the investigator is no longer looking at the phenomenon of language in general but at the particular structural differences existing across specific languages. The point is now

whether and to what extent the characteristics of specific languages have an impact on the thought or behaviour of those who speak them (Lucy 1996: 41).

This approach tackles linguistic diversity and seeks to uncover whether the meanings encoded in the particular lexical and grammatical constructs of different languages yield cross-individual differences at the cognitive level. This approach is essentially what Whorf labelled the principle of linguistic relativity (1956: 214). It is also concordant with the previous theme, so that knowledge of different languages may further enrich one's 'power of thought,' as Whorf (1956: 244) contended:

We handle even our plain English with much greater effect if we direct it from the vantage point of a multilingual awareness. For this reason I believe that those who envision a future world speaking only one tongue... hold a misguided ideal and would do the evolution of the human mind the greatest disservice.

This contention follows from Whorf's observation that languages differ greatly in the categories they create to refer to the world. As detailed above (section 1.1.), these categories inevitably fail to highlight all experiential features with equal emphasis, i.e. domain features receive different levels of codability and languages are partially referential only. Structural relativity seeks then to explore the variability in conceptual categories as delineated by language patterns. From this

contrastive template, it examines whether these linguistically-defined categories have come to pervade non-linguistic conceptualisation.

To be conclusive, structural relativity is better suited to the examination of substantial structural patterns at both the lexical and morpho-syntactic levels, rather than to isolated focuses on single and narrow domains and categories. Whorf himself advocated the study of the rapport between words and morphemes, and he illustrated this endeavour with studies on conceptions of time, space and matter (again echoing Einsteinian concerns). He made this position explicit a number of times, e.g.

The linguistic material in the above examples is limited to single words, and patterns of limited range. One cannot study the behavioural compulsiveness of such material without suspecting a much more far-reaching compulsion from large-scale patterning of grammatical categories, such as plurality, gender and similar classifications (animate, inanimate, etc.), tenses, voices, and other verb forms, classifications of the type of 'parts of speech,' and the matter of whether a given experience is denoted by a unit morpheme, an inflected word, or a syntactical combination. A category such as number is an attempted interpretation of a whole large order of experience, virtually of the world or of nature; it attempts to say how experience is to be segmented, what experience is to be called 'one' and what 'several' (Whorf 1956: 137).

Categories further range along a continuum of abstraction to the extent that they may not refer to directly perceivable concepts. The less perceptual and the more abstract the category, the more pervasive its influence on cognition is hypothesised to be – hence Whorf's concern with time and so on, rather than with isolated words and their actual referents, e.g. Boas's work on Eskimo words for snow (1911: 21-2). Furthermore, far from the naïve enterprise it may too easily be caricatured as being, the Whorfian position fully recognises that any isolated concept is accessible by the human mind, so long as it is accessible by *a* human mind. In other words, linguistic relativity is not characterised by terminological divergences:

The lack of a certain type of idea cannot be argued from an apparent lack of a term for the idea (Whorf & Trager 1938: 16).

Experimental research confirms this pattern, so that, for instance, work on colour categories has yielded much less systematic differences across different language speakers (see Lucy 1997a) than work on arithmetic computation (Dowker & Lloyd in press), or spatial navigation (Levinson 2003), or object property classifications (Lucy 1992b).

1.4.3. THE HYPOTHESIS OF DISCURSIVE RELATIVITY

Finally, as pointed out above, languages are internally patterned at the discursive, or pragmatic, level, where norms for actual interactions apply. Unlike structural patterns, pragmatic usage varies intralingually across speech communities, e.g. dialects. In other words, the various functions fulfilled by language show fluctuations in usage patterns across cultural groups

belonging to the same language community, depending on social variables such as gender, age, social class, and so on. The social variables responsible for these fluctuations in pragmatic usage are reflected in language by 'social markers,' or 'sociolinguistic variables' (Labov 1972). This functional specificity is indeed most typically taken as an identity stamp of group membership. As such, functional, or discursive, patterns of communication are therefore not loosely adhered to by speakers, but focally enacted by each individual. It is possible therefore to expect fashions of thinking to mirror fashions of speaking, as they so conveniently provide speakers with ready-made patterns of self-reference and identification within the larger world. The question now becomes

whether patterns of use have an impact on thought either directly or by virtue of amplifying or channelling any effects due to linguistic structure. We call this the hypothesis of discursive relativity, a relativity stemming from diversity in the functional (or goal-oriented) configuration of language means in the course of (inter)action (Lucy 1996: 52).

This line of reasoning was already present in Whorf's early writings, who explained that the rapport between basic components of grammar constitutes an underlying classificatory patternment which, when used by speakers, derives what he called 'fashions of speaking':

Concepts ... are not given in substantially the same form by experience to all men but depend upon the nature of the language or languages through the use of which they have been developed. They do not depend so much upon any one system (e.g., tense, or nouns) within the grammar as upon the ways of analysing and reporting experience which have become fixed in the language as integrated 'fashions of speaking' and which cut across the typical grammatical classifications, so that such a 'fashion' may include lexical, morphological, syntactic, and otherwise systematically diverse means co-ordinated in a certain frame of consistency (Whorf 1956: 158).

The possibility of discursive relativity was later made more explicit and formal in the work of Dell Hymes (e.g. 1966). He stressed that prior to an investigation of the structural differences across language groups was the necessity of an investigation of the functional similarities and differences in linguistic patterning as found within a language group. Hymes's goal was not so much to criticise Whorf's enterprise at the inter-lingual level of structural variability, as to broaden the scope of linguistic relativity beyond the structural and semantic planes to the pragmatic and discursive ones:

People who enact different cultures do to some extent experience distinct communicative systems, not merely the same natural communicative condition with different customs affixed. Cultural values and beliefs are in part constitutive of linguistic reality (Hymes 1966: 116).

This endeavour has also been famously furthered by Michael Silverstein (1979, 1981b) whose aim was to extend the study of linguistic relativity

from the plane of reference to the whole of language function (Silverstein 1979: 194).

This line of thinking has generated a whole plethora of research and has enabled the development of sociolinguistics and pragmatics as proper disciplines, no longer shadows of dialectology and philosophy circles. Most efforts so far have generated linguistic data, methodological understandings, typological drawing, interdisciplinary discussions, and the like. Yet it remains to be examined – in a psychological sense – whether communicative practices generate cognitive styles and local ideologies (Lucy 1996: 57) – a point discussed by Hymes himself (1961), yet for which he never provided either answers or methodological guidelines (Lucy 1992a: 91-2).

1.4.4. EVENT-SPECIFIC & EVENT-GENERAL HYPOTHESES

At the structural and functional levels, a further two fundamental hypotheses may be considered regarding the specific way in which potential influences are mediated (Gennari et al. 2002, Kita 2004).

Gennari et al. (2002) proposed an ‘event-specific hypothesis,’ according to which explicit access to language – be it oral, written, internal speech or other – impacts on cognitive performance by mediating language-paralleled patterns for non-linguistic thinking. In this case, influence mediation occurs somewhat punctually as linked to the languaging act, yielding online effects caused by the interference of psycholinguistic processing with general cognitive activity. This type of language effect on cognition has also been referred to as ‘online adjustment hypothesis’ by Kita (2004). Such a representation-specific type of effect would likely preclude the possible extrapolation of worldviews characteristic of a community of speakers. In fact, effects would be particularly limited to the here-and-now of language production and comprehension and would possibly yield unstable variability, proving malleable via experimental design.

Alternatively, language effects on cognition may be mediated yet more systematically without necessary appeal to verbal acts. In this ‘event-general’ scenario, typical language-x patterns pervade non-linguistic thinking whether or not those patterns are brought into explicit consciousness. In other words, individual cognition should be under the more-or-less constant hold of a speaker’s language in a somewhat ‘existential’ fashion whereby language frames of reference and meaning have become actual cognitive frames of reality conceptualisation. This type of influence mediation is more akin to Whorf’s original ideas (1956). It is also referred to as ‘learned typology hypothesis’ by Kita (2004). If such a representation-general pattern is closer to the truth, then it is more likely that experimental work should yield consistent cognitive

responses across the same language community, speaking to an overall set of putative reflexes ingrained in native speakers through the manipulation of given language representations as offered by their common language. In this case, experimental designs should not impact to the same degree on subject performance in controlled tasks, and one may further extrapolate the likelihood of local worldviews from those very sets of cognitive reflexes for interacting with the world.

1.5. SUMMARY

In a nutshell, linguistic relativity is the modern appellation characterising the old philosophical claim according to which language is critical to human thinking. This may be so at a broad semiotic level, so that as Sapir (1985: 17) suggested:

The instrument makes possible the product, the product refines the instrument.

Besides its characterisation of human cognitive abilities, language – via its diversity – may also be considered to engender differential perspectives for conceptualising the world, so that speakers of different tongues differ in their psychological analyses of and approaches to their environment. Section 1.4. suggested that this may be due to differences existing across linguistic systems in structures available for semantic articulation and/ or in discursive patterns for communicative goals. It is also possible that a combination of the two makes all the stronger the case for linguistic relativity at the code level (vs. semiotic level). This view is certainly concordant with Whorf's (e.g. 1956: 158), Hymes's (e.g. 1966), Silverstein's (e.g. 1981b), or Lucy's (e.g. 1996).

One of the crucial aims of this section has been to define as accurate an understanding of linguistic relativity à la Whorf as possible, and to clarify points of largely unjustified opaqueness regarding his very own understanding of language, thought and worldview. Such an endeavour proves a necessity as such opaqueness has plagued the further pursuit of his (and others') legitimate enterprise.

Whorf is viewed by some as an insightful genius and by others as a naïve amateur. Much of the controversy animated by his ideas resides as much in the boldness of his claims as in the ambiguity of his status as an unqualified young scholar, for whom linguistics was a hobby outside of his employment as a fire-prevention engineer. Like numerous revolutionary thinkers before him, Whorf has been vigorously marginalised by the dominant scholars of his own century. Such parallels with previous pioneers fail nonetheless to grant his ideas actual validity. As such, the few who to this day grant Whorf with genuine insights still approach his principle of relativity as one to be investigated empirically and tested as a working hypothesis.

Overall, questions regarding the influence of arbitrary symbols onto individual and collective cognition cannot be simply ignored, when one considers the likely implications of this very potential. Such implications are at first theoretical, contributing to our understanding of the disciplines of linguistics and psychology mainly, e.g. language acquisition, cognitive development, socialisation processes, evolutionary theories, etc. They also appear to be applicable in such areas as translation, foreign language learning and teaching, artificial intelligence programming, language therapy, social counselling, and the like. Perhaps more importantly though, such implications would be directly relevant to general human behaviour at the individual and at the collective levels, and would therefore be of great interest to the general public, as recent publications in the popular press have shown (e.g. *Scientific American* 25.03.04, 22.03.04; *Economist* 8.01.04; *New Scientist* 30.11.02, 31.01.04, 24.07.04; *The Japan Times* 9.10.03; *Science Express* 19.08.04). Indeed, the possibility of linguistic relativity as a cognitive theory of language and communication has implications for society as a whole, e.g. in aspects of life such as business, marketing, politics, media, religion, or simply interpersonal relations. Whorf himself was all too aware of the far-reaching entailments of his ideas:

The problems of achieving mutual understanding, of language barriers, of propaganda and advertising, of education, of the technique of managing human affairs without undue friction, of an intelligence in human relations that can keep pace with the changes brought by the physical sciences, all run afoul of this matter of language and thought (Whorf 1956: 82).

The idea that language builds a mental reality which is an adaptation of the raw, pre-given world entails that language is a potential tool for psychological manipulation – which can be used for the benefit of society, or otherwise. This understanding also has consequences for more theoretical debates over society and organised behaviour – a central topic in our contemporary pseudo-global world. A scientific basis for the idea that language is a manipulation tool, or a means to control the masses, has consequences for political and cultural theories of human collective behaviour, and for the application of these theories.

It appears ludicrous that, until recently, post-war academia has simply dismissed researching this question seriously on the basis of ideological discordance and of the alleged truth that all men and all languages are alike, regardless of their so-called superficial differences. Sadly too, most opinions on linguistic relativity are seemingly based on a non-academic evaluation of Benjamin Lee Whorf as a person. Whether Whorf was right, whether he expressed himself in an academic style we like, and whether his understanding of psychology, linguistics and general methodology was accurate, are irrelevant to the fact that such a fundamental question concerning the place of language in cognition simply begs an answer.

CHAPTER 2. HISTORICAL PERSPECTIVE

The aim of this section is to provide a description of the historical development of linguistic relativity, tracing the theory back to its origins in 18th century German Romanticism, and reviewing its evolution over the 19th and 20th centuries since then. The first section will examine relativism in pre-20th century philosophical thought, focusing particularly on German philosophers, Johann Hammann, Johann Herder, and Wilhelm von Humboldt. The following section will contextualise modern relativity in American anthropology, reviewing the ideas espoused by Franz Boas, Edward Sapir, and Benjamin Lee Whorf. The final section will present the evolution of the linguistic relativity principle in the post-war years, through studies in the disciplines of anthropology, dialectology (especially the Ethnography of Speaking tradition), and psychology.

2.1. PHILOSOPHICAL ORIGINS IN 18TH CENTURY GERMANY

In the history of philosophy, the idea of linguistic relativism found an appropriate slot for its development in the second half of the 18th century in German Romanticism. The 18th century is well-known as the period of the Enlightenment. This period fostered an intensive pursuit of knowledge, marked by an explosion of philosophical inquiries. Prior to the 18th century, doctrines of knowledge had been largely plagued with divinistic notions that were no longer deemed satisfactory. As a result, thinkers of this century attempted to emancipate philosophy from such fatalistic approaches. Enlightened theories, such as Immanuel Kant's (1724-1804) rationalism (Kant 1982, 1956), sought the sources of knowledge in humans – as opposed to God – and in human minds, and in particular *reason*. Rationalism was emancipatory in that it dispensed not only of divinism, but also of history, tradition, and experience in general. Rationalism claims that all knowledge derives from the ability to think and to apply reason and is thus a pure result of human minds.

Romanticism developed as a reaction against what is now called 'pre-Romantic' thought, which encompasses both Orthodox, or divine, and Enlightened, or rationalistic, doctrines. Romanticism grew out of aesthetic and expressive theories, whose point of departure consists of the empiricist claim that knowledge derives from lived experience. Rationalism and Romanticism therefore both agree that divine theories fail to provide the key to human knowledge, yet they disagree on the source of that knowledge being grounded either in reason or in experience. Human knowledge and understanding remain, nonetheless, the central focus of inquiry of both schools of thought, and this focus on the mind entailed in-depth explorations of

human cognition and thinking. Most importantly for the purposes of the current discussion, one central axis of disagreement between the two traditions was the study of language. In brief, Romantics believed language to be a considerable part of – if not the integral part of – thinking. For them, therefore, there is no such thing as a human mind prior to its acquisition of language as a cognitive tool. From this point follows their rejection of rationalism which posited an *a priori* cognition dismissive of lived experience, including language experience. Language consisted in the Romantics' evidence that Rationalism was plainly wrong.

18th century Europe – especially during the second half – was thus engaged in a rife debate over the nature of human reason, and over its relation to language. A fascination for sign systems and symbolic thought stamped the philosophy of this century more than any other topic, and the 18th century rightly witnessed the creation of Semiotics by French philosopher, E.B. de Condillac (1715-1780) (1987). The plethora of writings this generation of philosophers produced on the topic of language and cognition is unprecedented in history, and many of these early insights proved critical influences on modern linguistic science (see e.g. Sapir 1907, Saussure 1916, Chomsky 1965).

The most representative relativist figures in the German Romantic arena exploring the relation of language to thinking were Johann Georg Hamann (1730-1788), Johann Gottfried Herder (1744-1803), and Wilhelm von Humboldt (1767-1835). German thinkers were predominant on this scene of inquiry – though other European nationals were involved too – as Germany was then witnessing a revived interest in the study of its own language as a symbol of national character and honour, and a general concern for improving the German language as a result of the nationalistic-flavoured, environmentalist movement in 17th and 18th century Germany (see especially Leibnitz (1646-1716) 1697).

These German philosophers had originally been influenced by the works of the Roman poet and philosopher Titus Lucretius (99-55 BC) (1957), the Italian philologist Giambattista Vico (1668-1744) (1961), English aesthetic theorists, such as Thomas Blackwell (1701-1757) (1735), and later J.B. Monboddo (1774-92), and French writers, such as E.B. de Condillac (1715-1780) (1987), and J.J. Rousseau (1712-1778) (1823-6) – among others. All these scholars helped pave the way for the development of German expressive theories, by agreeing on the origin of language in human instincts and emotions, rather than in the human ability to reason.

Equally important, language was commonly compared to an organism, whose characteristics are defined by Brown (1967: 45) as being

a cooperative collocation of parts; in addition, these parts, as they develop, organise themselves in certain specific ways which are determined by the nature of the organism.

The dependence of part on part is not... a static relationship; one part entails the growth of another in the movement of the whole towards some end.

This rejection of atomism and movement towards connectionism underlies the thought of the philosophers to be reviewed in this section. The implication is that language is seen as inwardly structured and self-governed, and therefore as the independent variable in the language-thought-worldview ménage (*ibid.*: 53).

Finally, though these German philosophers belonged to a Romantic generation engaged in a Kantian revolution, their line of pursuit has itself often been labelled neo-Kantian (e.g. Foley 1997: 169) for, although they rejected Kant's view that such categories are universal and innate, they followed Kant in asserting that mental categories impose order upon sensible experience, thereby giving rise to neo-Kantian relativism. As in Kantianism, neo-Kantianism assumes that reality is chaotic. It is rendered coherent and organised when categorised and structured by coherent systems such as language, culture, theory, ideology, and the like. According to relativists, mental categories are moulded by language and by cultural artefacts, thus differing from speech community to speech community and from culture to culture. From differing categorisations and structures it logically follows that the way reality is organised and perceived by people varies – a conclusion these Romantic thinkers finally arrived at.

In order to grasp fully the relativist trends as they originally developed and later influenced 20th century thinking, the ideas of the three above-mentioned German thinkers are reviewed below, namely J.G. Hamann, J.G. Herder, and W. von Humboldt – with a special emphasis on Humboldt, the most important of them in terms of future influence.

2.1.1. JOHANN GEORG HAMANN (1730-1788)

Hamann may be considered a precursor to German Romanticism, in that he did not fully immerse himself in the movement as it developed in the second half of the 18th century and in the early 19th century. Hamann was himself a theologian and his philosophical pursuits largely reflected his profound interest in and devotion to religion. His intellectual curiosity was therefore animated by his faith. This also distinguished him from typical Romantics who dismissed divinism in their explanations of natural phenomena, including language. Indeed, unlike the Romantics, Hamann contended that language was a divine creation – God created man a languaging being, and thus He created language too. It is important to appreciate that Hamann did not believe that man was created and then given language, but instead man's creation entailed the simultaneous creation of language, for man is not man if without language. Hamann thus essentialised language as human essence. This divinistic position on the origins of language enabled Hamann to equate reason, or thinking, with language:

All talk about reason is merely wind; language is its organ and criterion (Hamann 1955-79 vol.5: 108).

Hamann considered that thinking consists of the use of symbols – imagistic and linguistic. From this, he inferred that semiotic systems and cognition constitute a single unified process. For him, the human ability to think presupposes the emergence of semiotic systems – such as language – while the implementation of a linguistic system is worked out before intellectual development. In addition to this, language helps intellectual development and the sharpening of the analytical mind. Hamann therefore disagreed with Kant's belief that language was a creation of human reason, for this position assumes an a priori ability to think without language:

If a chief question remains – *how is the power to think possible?* – The power to think *right and left, before and without, with and above* experience? Then it does not take a deduction to prove the genealogical priority of language... Not only the entire ability to think rests on language... but language is also the *crux of the misunderstanding of reason with itself* (Hamann 1949-57 vol.3: 286).

Hamann was, like contemporary Romanticists, a true empiricist, and saw language as directly related to humans' lives and experiences. He attributed to language a mediating role between its speakers and their surrounding world – including themselves and God. Taking this point yet further, Hamann placed language within its context of use, i.e. society, claiming that words obtain their meanings from the agreement obtained across a community of speakers:

It's not worth another word until one has reached an agreement on what everybody understands by reason and faith, not what Hume, you and I mean, but what the matter is and whether it is one. A general term is an empty tube which modifies itself at any moment (Hamann 1955-79 vol.7: 172).

Hamann therefore acknowledged that though Language is divine, languages are human, empirical derivations of lived experience, whereby word meanings are in constant flux, and languages are dynamic entities. Another point implicit in the above statement is Hamann's pioneering realisation of the obvious arbitrariness of the sign (cf. Saussure 1916). This point is concordant with his overall belief that languages are not purely referential in function, but more centrally, languages are symbolic metaphors of life. Word meanings are therefore neither fixed, nor iconic:

Words have their value, like numbers, according to the position they occupy, and their concepts, like coins, are changeable in their determinations and relations according to place and number (Hamann 1955-79 vol.7: 172).

Finally, because language is an inherently human manifestation, Hamann also suggested that there must be similarities across all natural languages, but this was only to stress implicitly the amazing array of differences existing across languages. In this regard, Hamann held that linguistic differences entail subsequent cognitive variations across speakers of various tongues:

The lineaments [of a people's] language will also correspond to the whole direction of their sort of thinking (1762: 123).

For indeed, and this was a typically Romantic notion, language is the vehicle of man's worldviews, and it colours speakers' reality with varying shades and hues according to its particular nature.

2.1.2. JOHANN GOTTFRIED HERDER (1744-1803)

Influenced by Hamann's ideas and fully immersed in the first phase of German Romanticism, Herder (1777-1803) developed a somewhat radical relativism. He suggested that thought is internalised language, and further, that thought is impossible without language. In short, he equated speaking with thinking:

Language [is] the tool, the content, and the form of human thoughts (ibid. vol.2: 24).

Reason... itself is and is called language (ibid. vol.21: 274).

More generally, what is to be inferred from Herder's approach to the language-thought relationship is that language and thought are interdependent – one cannot be without the other.

Like Hamann therefore, he vigorously criticised Kant's notion of an a priori cognition, which does not take language into account, as Herder, too, was a true empiricist – often acknowledging his inspiration from the rich British empiricist tradition of the time, as illustrated by the famous triumvirate consisting of John Locke (1632-1704) (1823), George Berkeley (1685-1753) (1948-57), and David Hume (1711-1776) (1874-5). He therefore believed that knowledge is arrived at via experiential perception, which is by no means “independent of language, but is always made possible through language” (Cloeren 1988: 41). So, too, in his eyes, language fulfils a mediating role between human reason and the world of experience.

Like many of his predecessors, Herder also considered language an indispensable tool for the refinement of intellectual thinking. As he defined it, language is “a natural organ of the understanding” (Herder 1777-1803 vol.5: 100), via which cognition is not only mediated, but also limited. This latter point is an important one in understanding how Herder drew pessimistic conclusions regarding human cognition. His philosophy of language led him to articulate the notion that although language may be enabling, it *must* be limiting too. This realisation, which added to his belief that human minds are prisoners of their native language cells, also raised his fears of the “bad influences” of language on reason (ibid. vol.2: 25):

If it is true that we cannot think without thoughts and learn thinking through words, then language provides the limits and outline for all human knowledge (ibid.: 17).

In other words, Herder realised the dangers of linguacentrism for the sciences and philosophy, and for human knowledge in general. His point, far from being an idle one, has been echoed by 20th century relativists in their concern for a metalanguage to describe experience 'objectively' (e.g. Whorf 1956: 6, Lucy 1992a: 273-5). Herder thus aimed to clarify all terms and rid philosophy of misleading, and according to him, vacuous words:

Each clear concept shall have only one expression; had it more, it would be superfluous, useless or pernicious (Herder 1877-1913 vol.2: 92).

Like most thinkers of the time, Herder was also led by his investigations to ponder over the origins of language and the development of reason. By rejecting divinism, Herder no longer had Hamann's simple explanation for those origins, and was knowingly confronted by the dilemma voiced by French philosopher, J.J. Rousseau (1987: 194), according to which

If men stood in need of speech to learn to think, they must have stood in still greater need of the art of thinking to invent that of speaking.

Herder failed to provide a satisfactory answer to this dilemma. However, the investigation led him into a deeper analysis of both language and thinking. The closest he reached to a satisfactory position on the matter relates to his important insistence on thought consisting of 'reflection,' which, according to Herder, is itself the very process whereby we allocate meanings to signs. Reflection, he suggested, consists of the objectification of perceptions. It is the process whereby humans take consciousness of their thoughts. This process is only made possible through the articulation of meaning-bearing language signs, which flesh out the thoughts from the chaotic amalgam of sensations. For this conclusion, Herder dissociated the 'signified' from the 'signifier' in his analyses, and, like Hamann before him, he recognised the arbitrary nature of words:

For what does colour, roundness have in common with the names we have given them? (Herder 1877-1913 vol. 5: 60).

By doing so, Herder was able to disentangle meanings from signs, whilst seeing that signs crystallise meanings in an object sound-form. Overall, his writings betray the belief that language meanings are no different to cognitive concepts, and from this understanding, Herder argued that thinking and meaning-making co-occur, as both derive from the same power of human reason. In other words, Herder claimed that cognition is semiotic, and that hence, humans are symbolic creatures, whose conscious thinking is determined by the concepts crystallised in the signs they use.

Finally, Herder was also imbued with a German national spirit and his writings bear the stamp of the nationalistic impulse in vogue at the time. He saw language and culture as

reflecting the world in particular ways. Each language embodies a specific personality or individuality, which characterises a people and their nation – once again, this is a typical aesthetic notion as developed in Romanticism, and which was taken much further by Wilhelm von Humboldt.

2.1.3. WILHELM VON HUMBOLDT (1767-1835)

Humboldt is probably best known as the first relativist and the inspiring figure behind the later works of Boas, Sapir, and Whorf in the early 20th century. Yet, as has just been illustrated, Humboldt was not a pioneer as such of linguistic relativity. Rather, he was the first person to synthesise earlier theories and to put forward a strong case for linguistic relativity to the extent that his writings have now become the most widely-acknowledged, earliest works of reference in the field (Brown 1967: 17).

Humboldt can be seen as both a universalist and a relativist. This divergence stems from the fact that he was historically caught between Kantianism and Romanticism. His transition from the first school of thought to the second coincides with the turn of the 19th century. This may be explained by Kant's death in 1804, the growing influence of Hamann's and Herder's writings by the end of the 18th century, the return from America of his younger brother, Alexander von Humboldt, who brought back with him 'exotic' ethnographic and linguistic data, and by his stay in Paris amongst French philosophers from 1797 to 1801, on which he himself commented: "my stay in Paris is making a [new] epoch in my thinking" (1840:62). Humboldt's shift to relativism became more and more pronounced as he increasingly immersed himself in the analysis of actual linguistic data. Nonetheless, his theoretical approach always remained suffused with universalism,¹ in that Humboldt believed all languages to have the same goal, the same origin, and the same basic nature. He defined the nature of language as being based on (a) the objective reality, i.e. the environment, (b) the subjective reality as construed by men, i.e. culture, and (c) the particulars of specific languages, i.e. grammar:

Language... is therefore the result of three combined effects, the real nature of objects... the subjective character of nations and the individuality of language (Humboldt 1903-36: 25-6).

At the same time, Humboldt was greatly influenced by Herder's writings, and he echoed many of his ideas and even phraseology, e.g. on reflection, consciousness, and word objects. Like Herder, he understood thinking as reflection, language as "acts of signification through articulation" of sound forms (Mueller-Vollmer 1990:17), and concepts as semantic meanings:

¹ In this respect, it is interesting to note, for instance, how frequently Humboldt is referred to in Chomsky's work on universal grammar (e.g. 1965, especially Chapter 1).

Language, therefore, is... the operation of joining together two different but inherently structured spheres: that of the articulated sound (the signifier) and of the “thought” or the signified (Humboldt 1903-36: 25-6).

This Herderian influence was centrally perceived through Humboldt’s reiteration that linguistic structure affects speakers’ perceptions and thoughts:

Language is the formative organ of *thought*. *Intellectual activity*, entirely mental, entirely internal, and to some extent passing without trace, becomes, through *sound*, externalised in speech and perceptible to the senses. Thought and language are therefore one and inseparable from each other. But the former is also intrinsically bound to the necessity of entering into a *union* with the verbal sound; thought cannot otherwise achieve clarity, nor the representation become a concept (Humboldt 1999: 54-5).

In other words, he too refuted Kantianism and claimed instead that language is the “a priori framework of cognition” (quoted in Brown, 1967: 90; Steiner, 1992: 85; Foley, 1997: 193); that is, language imposes a categorised, organised, and well-delineated framework upon the free flux of sensations, and by doing so, provides the very basis for cognition. In this light, Humboldt acknowledged the partial referentiality of signs giving rise to a relativity at the level of conceptual construal:

concepts, once marked by individual words, can no longer represent something purely *general*, but only something well-nigh individualising (Humboldt 1999: 93).

This argumentative position enables a conclusive transition to linguistic and hence cognitive diversity. Indeed, given that languages differ, those well-delineated frameworks of reference are altered, and speakers of various tongues differ, cognitively speaking, in their apprehension of the external world – or worldview. His claim was that, by the very process of objectifying thoughts about the world, language enables the construal of worldviews:

Language appears to present to us subjectively our entire mental activity... but it generates at the same time the objects in as much as they are objects in our thinking... Language is, therefore, if not altogether, at least in terms of perception, the means by which [each] human being constructs at the same time himself and the world or, by which he, rather, becomes conscious of himself by discriminating between himself and the world (from Heeschen 1977: 133-4, translated by Koerner 2000: 9).

One of Humboldt’s most important aims was to demonstrate this point, namely how different languages generate different responses to life. In Humboldt’s argument, it is implied that the influence of language on thought is mediated by the crucial notion of worldview, or *Weltansicht*, or *Weltanschauung*. Humboldt placed greater stress on worldview, seeing language as mainly having a social nature, and a mediating role between the outside material world and human consciousness and ‘national character.’ In other words, language lies between the pre-existing reality and human subjectivity:

The sum of all words – language – is a universe which lies midway between the external, phenomenal one and our own inwardly active one (Humboldt 1963: 249).

Humboldt further acknowledged the importance of the ‘sum of all words’ in his writings, as he, unlike Herder and other such philosophers, yet like numerous 20th century linguists after him, considered semantic relations to emerge out of grammar – rather than lexis. Morpho-syntactic relations are thus the locus of individuals’ worldviews:

Grammatical differences among languages depend less than those among words upon a difference of sound, but rest primarily upon a difference in grammatical outlook. Grammar is thus more closely related to the spiritual character of a nation than is the formation of words (Humboldt 1903-36: 338).

A few extra points in Humboldt’s thinking are critical in understanding how he came to the conclusion that language embodies thought and worldview. First, Humboldt granted language inherent dynamism:

under no circumstances can a language be examined like a dead plant. *Language and life* are inseparable concepts, and to *learn* in this area is always merely to *regenerate* (Humboldt 1999: 93).

Given his belief of language as “the formative organ of thought” (ibid.: 54), the dynamism of language entails that human cognition is dynamic too. However, language is itself possible only through human cognition, and is viewed as the very activity of thinking. So the direction of the influence between language and thinking is necessarily a reciprocal one:

Language is quite peculiarly confronted by an unending and truly boundless domain, the essence of all that can be thought. It must therefore make infinite employment of finite means, and is able to do so through the power which produces identity of language and thought. But this also necessarily implies that language should exert its effect in two directions at once, in that it first proceeds outwards to the utterance, but then also back again to the powers that engender it (ibid.: 91).

This understanding of language as endlessly productive and as standing in a dynamic relationship with cognition affords language an active role in human perception; and like Herder, Humboldt eventually came to believe in the restricting powers of language over individual and collective cognition:

The *word* is the individual shaping of the concept... [and] is a *constraint* upon [the soul’s] ever more capacious inner sensitivity, and often threatens to stifle the most individual nuances thereof by a nature that in sound is more material, and in meaning too general (ibid.: 92).

Every language sets certain limits to the spirit of those who speak it; it assumes a certain direction and, by doing so, excludes many others (Humboldt 1963: 245).

However, unlike Herder, Humboldt did not articulate a pessimistic philosophy of language as a result. Instead, he saw that the study of the philosophy of language and metalinguistic

knowledge could free the mind from its linguistic and conceptual 'prison,' as it would enable the individual consciousness to dissociate the concept from the sign:

The designation of the *concept* by the *sound* is a coupling of things whose nature, in truth, can never be united... The soul must treat the word more as a resting-place for its inner activity, rather than let itself be imprisoned within verbal limits (Humboldt 1999: 92).

Finally, it is worth considering Humboldt's understanding of the very purpose of language, i.e. communication, in order to see how his conclusion on the nature of worldviews was eventually reached. Humboldt's understanding of communication derives from aesthetic theories claiming the rise of language as due to individual needs for emotive self-expression:

everyone uses language to express his most particular individuality; for it proceeds from the individual, and each uses it primarily for himself alone. Yet it suffices everyone, insofar as words, however inadequate, fulfil the urge to express one's innermost feelings (ibid.: 151).

In this sense, communication is not so much a semiotic enterprise as some transcendental touching of the soul:

Men do not understand one another by actually exchanging signs for things, nor by mutually occasioning one another to produce exactly and completely the same concept; they do it by touching in one another the same link in the chain of their sensory ideas and internal conceptualisations, by striking the same note on their mental instrument, whereupon matching but not identical concepts are engendered in each (ibid.: 152).

This vision of communication is possible when taking Humboldt's radical equation of articulated language meanings with cognitive concepts. This position further led him to the belief that grammarians' and philosophers' endeavours to explore and understand language and worldviews were bound to be superficial:

We can split up concepts, dismember words, as far as we are able, and we still get no closer to the secret of how the thought actually couples with the word. In their most primal relation to the nature of individuality, therefore, language and the basis of all nationality have a direct resemblance to one another. But the effect of the former is stronger and more evident, and the concept of a nation must chiefly be founded upon it (ibid.: 152-3).

Indeed, the grammarian must become a student of men's souls and take on the role of a psychologist or ethnographer to this end. Humboldt consequently based his methods for empirical study on the above understanding, and as a result, his linguistic analyses are suffused with great subjectivity as he set to

demonstrate[e] the lively and inseparable *connection* between *languages* and the *mental capacity of nations* (ibid.: 217).

In a modern sense, his work followed no clear methodology, and when it did, it proved seriously flawed. Humboldt's major weakness was to draw judgemental appreciations of language users and whole nations based on his own evaluation of the forms of language most prone to favour

intellectual refinement. His analyses therefore distinguished ‘correct,’ or ‘regular’ forms from ‘deviant’ ones:

I can never avoid a clear and open adoption of the decisive contrast between languages of *purely regular* form, and those of a form that *deviates* from this... we simply deny [these deviant languages] the capacity to act, of themselves, in so ordered, so versatile and so harmonious a fashion upon the mind (ibid.: 218).

This proves to be a source of ambiguity as no assessment of the ‘mental capacity of nations’ was provided by Humboldt, so that his writings are forever circular and speculative (Brown 1967: 110-3).

For all his methodological and diplomatic inadequacies, Humboldt did adopt an empirical, comparative approach to the study of languages, thereby superseding theoretical and philosophical writings through detailed cross-linguistic examinations, e.g. Latin, Greek, Sanskrit, Chinese, Polynesian, Malay, Kawi, Burmese, Basque, or again North American languages. Yet again, this proved problematic when he identified the ‘inflectional’ language-type as the only ‘correct’ one, and allocated Sanskrit the linguistic status closest to perfection amongst the world’s languages, thereafter comparing all other languages – and nations – relative to it:

the *Sanskritic languages* come closest to this [perfect] form, and are likewise those in which the mental cultivation of mankind has evolved most happily in the longest sequence of advances. We can therefore regard them as a fixed *point of comparison* for *all the rest* (Humboldt 1999: 216).

In other words, Humboldt assumed Indo-European languages, especially Sanskrit, to be superior to others in linguistic quality and in the intellectual potential they provide for their native users. As such, Humboldt fell into the trap of linguacentrism and lost all notion of objective analysis, which is so central to argumentative validity. As Aarsleff (1988: 10 & 32) notes in his review of Humboldt’s life and work,

This is not linguistic relativism but linguistic absolutism. One might call it incipient racism... the merits of the languages themselves are prejudged by already formed opinion about the level of culture and civilisation of the nations that speak them.

To summarise, Humboldtian philosophy examined language from different perspectives: (a) speech at the individual level, (b) language at the national level, and (c) Language at the human level. Such an ambitious agenda entailed the study of the phenomenon of language, the examination of actual languages, including non-Indo-European languages, linguistic analyses of grammatical categories and typological classification, the study of meanings and concepts, and the development of a *Weltanschauung* theory through the examination of the relation between language structure and socio-cultural life – not to mention the study of philosophical inquiry

itself. As both a philosopher and a comparative linguist, Humboldt therefore covered tremendous breadth of ground in his investigations, and his contribution to later developments in modern linguistic theory cannot be overestimated. Overall, it seems that the general youth and inexperience of linguistics as a field of inquiry gave Humboldt an open mind as to the possible implications of its manifestations. He certainly did not perceive relativism and universalism to be antithetical as he recognised simultaneously a universal nature in language and the existence of cross-linguistic variations, and further sought to investigate the potential meaning behind such differences. Though his empirical methods cannot afford much modern credit, many of his theoretical insights remain powerfully lucid. As Streitberg (1909: 407) notes:

Humboldt, for all his empiricism, was a true son of the philosophical (eighteenth) century.

2.2. EARLY 20TH CENTURY AMERICAN ANTHROPOLOGY

The next most important development in the history of linguistic relativity took place in American anthropological circles in the early 20th century. However, Humboldt's and the Romantics' ideas were not abandoned during the 19th century. They found inspirational ground in the work of famous thinkers in Germany, and also in the United States. German scholars provided important contributions to the continuation of Humboldtian thought, and to the eventual shaping of early 20th-century academic endeavours (Koerner 2000: 6). These included the Leipzig psychologist Wilhelm Wundt (1832-1920), the Berlin anthropologist Adolf Bastian (1826-1905) whose assistant in 1885 and 1886 was no other than the young Franz Boas, and also the Berlin linguist Heymann Steinthal (1823-1899) whom Boas acknowledged as a valuable source of influence on his understanding of language and culture:

The intimate ties between language and ethnic psychology were expressed by no one more clearly than by Steinthal, who perceived that the form of thought is moulded by the whole social environment of which language is part (Boas 1974: 28).

American scholars included anthropologist Daniel Garrison Brinton (1837-1899), who translated some of Humboldt's German manuscripts into English (Brinton 1885), and by the same token reiterated Humboldtian ideas concerning the

fixed relation between the idiom and the ideas of a people (Brinton 1891: 33).

William Dwight Whitney (1827-1894), one of the most famous American linguists of the second half of the 19th century, also embraced Humboldtian beliefs:

Every single language has... its own peculiar framework of established distinctions, its shapes and forms of thought, into which, for the human being who learns that language as his 'mother-tongue,' is cast the content and product of the mind, his store house of impressions, however acquired, his experience and knowledge of the world. This is what

is sometimes called the ‘inner form’ of language, the shaper and cast of thought, as fitted to a certain body of expression (Whitney 1875: 21-2).

Yet another notable American figure who perpetuated Humboldtian philosophy was John Wesley Powell (1834-1902), who is perhaps most famous for having published one of the very first thorough reports on Amerindian languages (Powell 1877) – an endeavour later taken up by Franz Boas (1966). More importantly, Powell proved a crucial pivotal figure in the establishment of anthropology in the States. He helped to create the Bureau of American Ethnology (henceforth BAE) in 1879 – which he presided until his death in 1902 – thereby starting the professionalisation of anthropology in the United States, where Boas was later to emigrate in 1886.² The BAE was a governmentally-funded administrative body, and its research focused on classifying Amerindian tribes, as set out by the political agenda of the time. To this end, Powell believed language – as opposed to race – to be the “key to ethnic classification” (Darnell 1998: 38). As such, Powell was not only central in shaping early American anthropology, but he also generated a very rich amount of linguistic data, which later proved the very corner stone of articulation of linguistic relativity.

All the above thinkers – and others – pursued the study of the relationship between language, thought and worldview in various fields of inquiry, including linguistics, psychology, and anthropology, establishing a disciplinary triumvirate, which was to be formalised in American anthropology at the start of the 20th century. For this reason and others to be reviewed below, the turn of the 20th century and its first four decades mark a critical template for the further development of what was about to be known as ‘linguistic relativity,’ and as such, are considered by most as the starting point of modern relativity.

This section will be dedicated to an exploration of these four decades. It will focus on the three pivotal figures without whom the relativist edifice would not have stood as it did, namely Franz Boas, Edward Sapir and Benjamin Lee Whorf. Boas was important in bridging 18th- and 19th-century (largely) philosophical interests with the modern study of man, i.e. anthropology, in the early 20th century. His student, Sapir, furthered this bridging, but restored the study of language to the centre-stage of the inquiry – instead of culture. Finally, Whorf, inspired by both Boas and Sapir, framed linguistic relativity as an explicit and formal focus of study.

² Note that prior to the BAE, ethnologists were self-trained amateurs with no professional recognition. Brinton, for instance, was not salaried in his professorship at the University of Pennsylvania (Darnell 1970).

2.2.1. FRANZ BOAS (1858-1942)

Franz Boas was born and educated in Germany, but eventually moved to the U.S. in 1886, aged 28, where he later became known as the ‘founder’ of American anthropology. Boas was neither a linguist nor an anthropologist at first, but a physicist and a geographer. Whilst he was still in Germany, he showed a deep interest in the correlation between the psychology of a people and their environment – historical and geographic (Darnell 1998: 276). When he arrived in the U.S., he already possessed a very diverse intellectual set of interests, and had just completed a two-year period of employment with the German anthropologist Adolf Bastian, as mentioned above. Moreover, the BAE, which he was to join, was in full development and was certainly the only institution of its type in the U.S. at the time of Boas’s immigration, and he naturally became engaged with Powell – himself a physicist originally – and many of his other colleagues.

Many critical points led Boas to develop his interests in social anthropology with a special emphasis on the study of languages, in the way he did. One starting point for this interest was the classical predominance of linguistic studies in the German intellectual tradition. Such an intellectual background added to his interests into the links between human minds and their surroundings. These interests blossomed at the BAE through his shared understanding with Powell regarding fundamental intellectual notions, including an insistence on the centrality of language and symbolic forms in understanding culture and the implementation of rigorous cultural fieldwork. Boas, like Powell, considered culture as a cohesive symbolic system of life patterns, as only partially determined by the environment, and more largely determined by human minds (Boas 1888). Boas (e.g. 1911), again like Powell, insisted that race was not the appropriate variable for classifying societies – rather, that culture was the “appropriate unifying concept for the emerging professional discipline of anthropology” (Darnell 1998: xiii). Indeed, the BAE’s objective was to document and classify ethnic diversity in the U.S., and Powell strongly contended that language was the aptest of variables for such ethnic classification, seeing obvious correlations between language and social life.

As argued by Darnell (1998), Boas did not revolutionise American anthropology within a vacuum, but instead built on the solid foundations laid down by Powell and the BAE. He did so mostly in the early 1900s, taking over Powell’s aim to professionalise anthropology and training young scholars through university programmes. This was made possible by the re-organisation of the American education system at the time and by the fact that professional research bodies barely existed. Not surprisingly then, Boas did not start his teaching career in an anthropology department, but in the Psychology department at Clark University in 1889, where he nevertheless came to develop a programme of anthropological training, and supervised the first

American PhD in anthropology (awarded in 1892 to A.F. Chamberlain). In 1892, Boas resigned and worked as F.W. Putnam's (1839-1915) assistant at the World Columbian Exposition, eventually obtaining a teaching position at Columbia University in 1896, where he attracted high-flying students, such as A.L. Kroeber, R.H. Lowie, E. Sapir, P. Radin, and others. Boas offered his students a holistic training which not only emphasised the meticulous study of symbolisms and historical development for understanding cultures, but which also required intensive fieldwork similar to that carried out in modern research. Echoing BAE endeavours, the work Boas assigned his students was mainly descriptive and comparative, yet it also went beyond the ethnic classificatory agenda of the BAE, by actively seeking knowledge of a psychological nature concerning native perspectives of the world and common features of the human mind across cultural models. Importantly, this empiricist shift away from 'armchair anthropology' to an in-depth, 'hands-on' approach, focusing on symbolic behaviour, proved a complete novelty which defined anthropological methodology in the early 20th century, as Boas's students later found teaching positions in newly-set-up anthropological departments across the U.S. – thus establishing a Boasian 'reign' over early 20th-century academia in anthropology.

Fundamentally, Boas, like Powell, promoted an understanding of the central role of linguistics in anthropology, and the professional discipline which he created, together with Powell, bore the holistic flavour of a multi-disciplinary science encompassing the study of all aspects of human lives, with language as its symbolic form, and human psychology as its penultimate discovery. Boas was therefore central in creating a modern environment within which the pursuit of earlier interests in language, mind, and culture would be able to flourish, eventually leading to arguments for linguistic relativity.

Boas's own writings mark an early start for the relativity position. Departing from the BAE classificatory tradition, Boas articulated one of the foundational arguments for relativity. Indeed, possibly one of his most important contribution in this regard, and certainly his most constant point of emphasis, was that language organises the world of human experience via classification and categorisation:³

Since the total range of personal experience which language serves to express is infinitely varied, and its whole scope must be expressed by a limited number of phonetic groups, it

³ Note that such an argument further echoes earlier developments in German philosophy. As seen in section 2.1., the classificatory nature of mental constructs is a Kantian notion. In this respect, Boas was a modern neo-Kantian as he agreed with Kant on this point and on the fact that language and culture are essentially constructs of the human mind; yet, like the Romantics, he held an empiricist view of culture, which also acknowledged history and the environment.

is obvious that an extended classification of experiences must underlie all articulate speech (1966: 20).

Through his own fieldwork and contrastive linguistic analyses, Boas was soon led to conclude that languages organise reality differently, through differing categorisations:

the groups of ideas expressed by specific phonetic groups show very material differences in different languages, and do not conform by any means to the same principles of classification (ibid.: 21).

Boas understood these differences as arising from cultural diversity. His linguistic data also made him realise that linguistic expressions only partially depict what the speaker has in mind, and that different languages highlight different aspects of what is to be communicated – thus taking on Humboldt's idea that language makes infinite use of finite means (Humboldt 1999: 91):

In each language only a part of the complete concept that we have in mind is expressed, and each language has a peculiar tendency to select this or that aspect of the mental image which is conveyed by the expression of the thought (Boas 1966: 39).

These points constitute the very basis for the conclusion that specific languages encode concepts incompletely, and generate specific mental imageries in reference to the same objective world. It is but an argumentative hop to then infer that speakers of different languages therefore construe different realities, obtaining various human *Weltanschauungen* relative to native tongues. Boas did not articulate this point explicitly. In fact, Boas was careful not to extrapolate psychological assumptions out of his data, and his work remained, for methodological reasons, primarily descriptive.

A final point made by Boas concerns language and awareness. Boas regarded the highly systematic nature of language as the artefact responsible for speakers' lack of conscious realisation of the workings and cognitive implications of speech:

linguistic classifications never rise to consciousness, while in other ethnological phenomena, although the same unconscious origin prevails, these often rise into consciousness, and thus give rise to secondary reasoning and to re-interpretations (ibid.: 63).

The implication of such a statement is that people stand powerless, as it were, at the mercy of whichever language they grow up to speak, to the extent that their unawareness suppresses their own free-will.⁴ The idea of linguistic constraints on freedom was already present in Herder's and Humboldt's less well-grounded ideological philosophy of language, as Aarsleff's review testifies:

⁴ Once again, Boas leaves this implicit.

Language itself becomes an alien object that exerts dominion over the mind, which is now no longer free to exercise its unhindered creativity (1988: 27-28).

Overall, nonetheless, Boas was much less adventurous in his conclusions than were his 18th-century predecessors. He never resolved for himself whether or not language influences – let alone determines – thought. All he clearly stated was that language reflects thought, basically adopting a ‘cloak theory’ of language.⁵ His inner conflict with relativistic claims seemed to stem from his strong belief in the universality of human psychological activity and cognitive ability, and from his view of language as being primarily a culturally moulded tool:

It does not seem likely that there is any direct relation between the culture of a tribe and the language they speak, except in so far as the form of the language will be moulded by the state of culture, but not in so far as a certain state of culture is conditioned by morphological traits of the language (Boas 1966: 63).

Furthermore, Boas, though profoundly fascinated by the correlations between human psychology and language, did not believe that these correlations could be validly explored and postulated until ethnological methods of investigation were adequate for this task – by which he meant the use of a quantitatively, purely scientific tool, such as statistics:

Boas rarely made general statements about the psychological implications of his findings. Psychological questions were to be postponed until an equally rigorous method of handling them could be developed (Darnell 1998: 280).

Finally, adopting a more conclusive position on the role of language in thought would have committed Boas to claims too akin to Humboldt’s linguistic absolutism, which ran counter to his own ideology concerning human sameness. Indeed, though Boas acknowledged his inspiration from Herderian and Humboldtian roots, he also criticised the misconceived, judgemental nature of their work, which too often oversimplified ‘exotic’ languages and cultures, and offered a negative evaluation of their people. Boas was constantly engaged in an epistemological rebellion against evolutionism and its ethnocentric contention that equated culture with civilisation, following a Western model of supposed superiority. Boas was forever a believer in the psychic unity of mankind which, in his eyes, was the one justification for the very feasibility of cross-cultural study and understanding. This standpoint demarcated Boasian ethnology as the only anthropological paradigm at the time allowing cultural study of a psychological type.

Boas, like Humboldt in some respects, was caught between relativism and universalism – an apparent paradox of which his writings over those four decades are testimonies:

⁵ That is, “language is a cloak conforming to the customary categories of thought” (Bruner et al. 1962: 11), as opposed to a *mould theory* in which language is seen as “a mould in terms of which thought categories are cast” (ibid.); the Whorfian postulate of linguistic relativity would be classed as a mould theory.

The categories of language compel us to see the world arranged in certain definite conceptual groups which, on account of our lack of knowledge of linguistic processes, are taken as objective categories and which, therefore, impose themselves upon the form of our thoughts (1966: 289).

This statement, made in 1920, is one of the closest Boas ever came to relativism. Yet, in 1909, he had already claimed that linguistic classifications relate to unconscious mental processes and even to sensory-motor perception – a point he exemplified with cross-linguistic differences in colour spectrums and their ensuing differences in human perception and visual discrimination:

linguistic classifications never rise into consciousness, and...consequently their origin must be sought, not in rational, but in automatic mental process... A knowledge of the categories under which in various cultures experience is classified will, therefore, help to an understanding of early psychological processes. Differences of principles of classification are found in the domain of sensations. For instance: it has been observed that colours are classified in quite distinct groups according to their similarities... The importance of the fact that in speech and thought the word calls forth a different picture, according to the classification of green and yellow or green and blue as one group can hardly be exaggerated (Boas 1910: 377).

Yet, by the end of his life, Boas again voiced caution over a potential linguistic influence on cognition and on culture, in particular:

I should not be inclined to overestimate this influence because devices for expressing... [various ideas] are ever-present, and may rise into idiomatic use. In this sense, we may say that language exerts a limited influence on culture (1942: 183).

To summarise, Boas – like Humboldt – believed that all languages share the same basic principles; yet where languages differ, they engender different organisations in what the mind perceives reality to be. Basically, each language is but a sample of the total potential thought available to the human interpretation of sensible experience.

Overall, Boas's primary focus of investigation remained on culture rather than language. Language is but an instrument enabling ethnological study following rigorous methods. His study of languages was ideologically driven too, in that he wished to promote the idea that Amerindian cultures and languages were not inferior or *primitive* as such, but on the contrary, elaborate and sophisticated in their own right, by virtue of being human creations. Under this light, Boas's and Humboldt's studies and interpretations of linguistic diversity were antipodal. Boas's work proved fruitful in enhancing cross-cultural tolerance and ontological liberalism in anthropological academia. His concern with the universality of man's traits stressed human brotherhood, while his concern with cross-cultural and cross-linguistic diversity stressed the need for openness towards and acceptance of differences in others. In short, by studying linguistic diversity, he sought to fight the prejudiced opinions of his contemporaries – and

predecessors – and their belief in an alleged Western superiority and thus in exotic inferiority. Boasian anthropology was therefore an emancipatory one.

2.2.2. EDWARD SAPIR (1884-1939)

Interestingly, Sapir too was born in Germany, and moved to the US with his parents in 1889, aged 5. His interest in language started early during his undergraduate years in Germanic studies. As a young graduate, he came to know Boas around 1904, and became his student at Columbia where he completed his masters' thesis on Herder's *Ursprung der Sprache* (Sapir 1907). Sapir was primarily interested in linguistics. Under Boas's strong recommendation for non-Indo-European fieldwork, he devoted several years of study to Amerindian languages in Washington and Oregon. He eventually obtained his doctorate in 1909, having submitted a thesis on Takelma⁶ grammar. In 1910, Sapir was appointed chief of the anthropology division in the Geological Survey of the Canadian National Museum in Ottawa. He remained in Canada for fifteen years, during which time he devoted himself to intensive first-hand data collection of native Canadian Indian languages. In 1925, he was offered a university position at Chicago, where he was soon promoted to a professorship in anthropology and general linguistics. These positions enabled Sapir to train young students in linguistic anthropology in a Boasian style. Finally, in 1931, he moved to a professorship at Yale, where he expanded his interests in psychology and sociology, and developed the research field of 'culture and personality.'

Sapir is most famous for his various contributions to phonology, historical linguistics, semantics, the social functions of speech, the psychology of language, structuralism, and culture theory. Sapir was a prolific scholarly writer and a fantastic intellectual with a rich knowledge combined with a sharp intuition. Sapir is indeed also well known as a published poet and an intellectual critic in the fields of music, literature, and psychoanalysis – besides language. His intellectual sensitivity enabled him to be an aesthetic visionary in many disciplines, including that of linguistics.

To this day, Sapir is uncontroversially acknowledged as a great linguist with pioneering and groundbreaking insights. His linguistic work was phenomenally diverse and analytically meticulous. Sapir's theoretical contributions to the young field of linguistics were also peppered with actual data from Indo-European, Amerindian, Sinitic and Semitic languages, along with methodological guidelines for the documentation of languages. However, Sapir did not believe the linguist's work to be limited to grammatical descriptions. Indeed, like his teacher Boas, he held a strongly holistic understanding of language, which he viewed as an integral part of

⁶ Takelma is a native Amerindian language from Oregon.

culture and of being human. He therefore perceived the study of language to be liberating in that it enables an understanding of individual societies and of humanity at large. Hence linguistic descriptions are only an accessory to understanding people and their construed micro-worlds (Mandelbaum 1985: iv-v). This line of thinking is very much in line with Boasian anthropology and, despite his unique emphasis on linguistics amongst Boas's students, Sapir remained a faithful disciple of his teacher's tradition – which he himself helped to perpetuate.

Sapir's earlier writings bear the Boasian anthropological stamp, in that they treat culture as the central influence on people's worldviews (e.g. 1921). A noticeable change appears in his post-mid 1920s writings, where language becomes the shaper of ideas – including cultural ideas. Joseph (1996) suggests that this change was due to the influence of Ogden & Richards (1923), which Sapir reviewed in 1924. From then on, his position became more interesting for the later development of linguistic relativity, and it is this position which this section will concentrate on.

Regarding his involvement in the language-and-thought debate, Sapir has often been said to have taken Boas's claims a step further, pointing the way towards relativity proper (Lucy 1992a: 17, Keesing 1992: 594, Palmer 1996: 12, Lee 1997: 181, Duranti 1997: 56). This shows the influence of Boas's teachings on Sapir, but it also demonstrates that Sapir proved able to read between the lines of Boas's writings and articulated the conclusions that Boas himself came to but did not dare to draw explicitly.

One of Sapir's central contributions was to clarify the notion of 'thought' and replace it with that of 'conceptualisation.' Indeed, in Sapir's approach to relativity, language acts as a channelling guide for thought, or conceptualisation:

The material of language reflects... the world of concepts and, on what I have ventured to call the 'pre-rational' plane, of images, which are the raw material of concepts (Sapir 1921: 38).

Yet, thought, as a process, is not relative as such, for Sapir takes it to be neurological and the same in all humans. In his view, what is relative is not thought processes, but instead, the encoding and understanding of concepts, or in other words, conceptual thinking:

The upshot of it all would be to make very real to us (i) a kind of relativity that is generally hidden from us by our naïve acceptance (ii) of fixed habits of speech as guides to an objective understanding of the nature of experience (iii). This is the relativity of concepts (iv) or, as it might be called, the relativity of the form of thought (v)... For its understanding the comparative data of linguistics are a *sine qua non* (vi). It is the appreciation of the relativity of the form of thought which results from linguistic study that is perhaps the most liberalising thing about it. What fetters the mind and benumbs the spirit is ever the dogged acceptance of absolutes (vii) (Sapir 1985: 159).

In this passage, Sapir fleshed out many of the points central to linguistic relativity – as already mentioned in the above sections:

- (i) the social (and inherently human) nature of language, whereby people may be identified as a group because they belong to the same speech community,
- (ii) the systematic and unconscious nature of language use – echoing Boas's views on language and awareness,
- (iii) the Kantian notion that language – via categorisation – imposes order on the raw pre-given environment, in order for humans to make sense of it,
- (iv) the implicit assumption that the diversity of tongues spoken in the world engenders different categorisations, descriptions, and identifications of concepts in language,
- (v) from the last two points, it follows that speakers of different languages must conceptualise raw experience in differing ways, hence obtaining different worldviews,
- (vi) the need for data from several languages, in order to implement productive contrastive analyses in terms of scientific orientation, and
- (vii) the ideological stand that awareness of language unblinds and frees the speaker – a notion already present in Humboldt's writings and left implicit in Boas's.

Equally important in Sapir's writings is the belief in the formal completeness of each linguistic system, i.e. each language as a semiotic system of reference is self-contained and therefore self-sufficient with respect to other semiotic systems:

The outstanding fact about any language is its formal completeness... To put this... in somewhat different words, we may say that a language is so constructed that no matter what any speaker of it may desire to communicate... the language is prepared to do his work... The world of linguistic forms, held within the framework of a given language, is a complete system of reference (*ibid.*: 153).

This explicit recognition of each language as being independent in its usage from any other and as being complete is essential to the further development of relativistic arguments, for it entails that each language is a self-governed system and assumes autonomy from other languages. All this led Sapir to believe in the incommensurability, or fundamental lack of equivalence, between cross-linguistic categories and concepts, and ultimately between languages and worldviews:

the 'real world' is to a large extent unconsciously built up on the language habits of the group... We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation. No two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached (*ibid.*: 162).⁷

⁷ See also Sapir (1964: 128) – quoted in section 1.1.

As this passage suggests, Sapir followed Boas in perceiving linguistic categories as encoding only a limited set of domain features, leaving much experiential material unexpressed. Like his teacher, Sapir treated linguistic items (i.e. words) as partial referential signs, acknowledging them as arbitrary symbols. However, he further contended that speakers' 'naïve acceptance' of this semiotic system renders words non-arbitrary at the individual level. In Sapir's view, the lexicon, by being 'agreed upon' and constituting group 'habits,' is a combined environmental and social construct. Therefore lexical inventories constitute partial interpretations of the world and are only subjectively adequate for its description. Because lexicons are subjective representations, the concepts they symbolise are linguistically manipulated. As a result, Sapir identified in lexicons a moulding power over conceptual formation as related to cultural understandings. In short, it is in this combination of semiotic arbitrariness on a grand scale and of non-arbitrariness on an individual scale, combined with referential partiality, that Sapir saw the potential for the construal of subjective realities relative to specific languages – corresponding to the concept of worldview.

In this respect, it is important to see that there is a distinction between views claiming that language is key to understanding a people's culture because it crystallises a nation's spirit, i.e. the *Weltanschauung* view adopted by German Romanticists, and views claiming that language transcends individual minds and imposes particular ways of thinking about the world, i.e. the Whorfian position:

The Whorfian hypothesis comprises, not one, but two sets of relationships between language and that which language may determine. One set concerns the development of a culture, and another set concerns the development of an individual. In other words, there are both culture-historical (phylogenetic) and life-historical (ontogenetic) dimensions and the standpoint taken on one dimension can be independent of the standpoint taken on the other (Hymes 1966: 120).

Though Hymes conceives of the two views as autonomous, it could be argued that the latter view entails the former to the extent that it relates to culture – though not vice versa. Boas's position remained closer to the former approach, through his perennial insistence on the centrality of culture. Sapir, on the other hand, articulated arguments in favour of the latter position. This position is better understood when taking into account his appreciation of the relation between language and culture through his understanding of language and of grammar in particular. As early as 1912, Sapir made a clear distinction between lexical forms and morphosyntactic patterns, stating that the former are linked to cultural and environmental demands, whereas the latter are not related to culture at all:

That a vocabulary should thus to a great degree reflect cultural complexity is practically self-evident, for a vocabulary, that is, the subject matter of a language, aims at any given time to serve as a set of symbols referring to the culture background of the group... there is a constant correlation between complexity of language and culture. If, however... linguistic complexity be used to refer to degree of morphologic and syntactic development, it is by no means true that such a correlation exists (Sapir 1985: 95).

This is an important distinction for it means that all aspects of grammar but the lexicon are independent of culture in Sapir's analyses. Sapir also claimed phonetic systems to be independent from culture (*ibid.*: 96-7). More important still, non-lexical grammatical forms are, in Sapir's view, cognitive mechanisms:

Linguistic morphology is nothing more nor less than a collective *art* of thought (Sapir 1921: 218).

Sapir's insights were novel in this respect. Unlike other Boasians, he insisted on the autonomy of linguistic form from outer pressures such as the environment or culture, and by the same token, he claimed the supremacy of form over content as the essence of language, referring to lexis as "the mere content of language" (*ibid.*:219):

The linguistic student should never make the mistake of identifying a language with its dictionary (*ibid.*).

He further dismissed phonology as the central defining core of language. Comparing spoken, written, and sign language types, he concluded that

The ease with which speech symbolism can be transferred from one sense to another, from technique to technique, itself indicates that the mere sounds of speech are not the essential fact of language, which lies rather in the classification, in the formal patterning, and in the relating of concepts. Once more, language, as a structure, is on its inner face the mould of thought (*ibid.*: 21-2).

His novel emphasis on 'patterning' and 'relations' lay behind his combined functionalist and structuralist definition of language (and culture at large), in which the notion of 'pattern' as obtained from sets of relations, or linkage, occupies a central position in determining the meanings generated by the system:

A pattern is a theory of activity having meaning in terms of the typical event of a given society. (We may distinguish a pattern from the total configuration.) A pattern is form, seen functionally. Things which seem the same are not, unless they function similarly (Sapir 1994: 106).

This insistence on form and patterning marked a profound shift in linguistic anthropology away from the descriptive study of lexical entries as cultural symbols to the study of grammatical patterns as psychological processes:

The psychological problem which most interests the linguist is the inner structure of language, in terms of unconscious psychic processes, not that of the individual's adaptation to this traditionally conserved structure (Sapir 1985: 152).⁸

By centring an understanding of language as grammatical form, and by viewing form as “definite modes of thought” (ibid.: 97), Sapir was able to equate language with those modes of thought.⁹

Language and our thought-grooves are inextricably interrelated, are, in a sense, one and the same (1921: 217-8).

And he was further able to argue for an overall dissociation of culture and language:

Nor can I believe that culture and language are in any true sense causally related. Culture may be defined as *what* a society does and thinks. Language is a particular *how* of thought... we shall do well to hold the drifts of language and of culture to be non-comparable and unrelated processes... all attempts to connect particular types of linguistic morphology with certain correlated stages of cultural development are vain. Rightly understood, such correlations are rubbish (ibid.: 218-9).

This position is a radical departure from Boas's stand on the relationship between language and culture. Both Sapir and Boas held culture to be a symbolic product of human minds. However, Boas contended that language was no more than a cultural instrument of expression. Sapir, on the other hand, argued that the psychological processes for cultural behaviour and language are different – as a result of adopting a different understanding of language. Hence, in Sapir's argument, cultural and linguistic behaviour are independent, cognitively speaking, despite their constant interplay in overt manifestations. Boas's vantage point could afford an understanding of linguistic differences in terms of cultural ones only, whereas Sapir's vantage point allowed him to see linguistic differences at once reflecting and creating different modes of thought – or conceptualisation. It now becomes transparent that Boas could not proceed to relativistic conclusions because he viewed language as a product of culture. On the other hand, by positing dissociation between the language and culture, Sapir (and later Whorf) was able to delve into psychological depths of potential impact – without the need to appeal to the variable of culture. In brief, Boas's argumentative position afforded glimpses of mild cultural relativism, whereas Sapir's insistence on the psychological independence of language could afford pure linguistic relativism.

Overall, Sapir's contribution to linguistic relativity was to lay central emphasis on language in the culture-language-thought triangle. By rejecting atomistic approaches to

⁸ Note that Sapir is again faithful to his tutor, Boas, in rejecting evolutionism as a driving force of linguistic inquiry.

⁹ Recall, nonetheless, the point made earlier regarding Sapir's definition of ‘thought’ as conceptualisation. In this sense, Sapir did *not* equate language with thought (Lucy 1992a: 20).

scientific understanding, he was able to relate language to all aspects of life, and especially to cognition, at the collective level with regard to worldview, and at the individual level with regard to psychology. He also united Boas's insightful teachings on linguistic classifications, the systematicity of language, the partial referentiality of signs, and the need for comparative study through anthropological fieldwork. Added to this, he also incorporated Herderian philosophy and *Weltanschauung* theory to his understanding of language. From this standpoint, his redefining of language and his consideration of conceptual thinking enabled him to advance a cohesive argumentation for the influence of language on individual 'thought' and collective worldview formation – which was all the better encouraged by similar thinking in his enthusiastic student, Benjamin Lee Whorf.

2.2.3. BENJAMIN LEE WHORF (1897-1941)

Unlike Sapir and Boas, Whorf never became a professional scholar, nor did he ever obtain any formal qualification in anthropology, linguistics, or even psychology. With a B.Sc. in chemical engineering from M.I.T. obtained in 1918, he found employment as a fire-prevention chemical engineer in an insurance company, where he worked full-time from 1919 to the end of his life. Whorf was greatly valued in his work and was granted several promotions. Throughout his life, Whorf was a keen and curious thinker, and he always juggled his professional commitments with his scholarly pursuits – at first, reading widely and offering talks in clubs and societies, and later handling a more than part-time unofficial academic career involving courses, assignments, fieldwork, presentations, publications, and teaching. He always insisted that his various intellectual interests should be pursued as pastimes for pleasurable ends. The quality of his amateur work was nonetheless widely acknowledged. He was awarded research fellowships and subventions despite having no postgraduate qualification. His work was accepted at academic conferences, and he was widely published in the popular and scientific presses. He was also offered several academic positions in the 1930s, which he always declined – except for a one-year lectureship in Anthropology at Yale, in 1938-39.

His interests ventured into linguistics somewhat by accident through his more primary interests in botany, botanical terminology and, most significantly, religion. He turned to language studies around 1924 when learning Hebrew to satisfy his biblical understanding. Through this undertaking, he came across Antoine Fabre d'Olivet's (1768-1825) *La langue hébraïque restituée* (1991), which was to influence his entire thinking about language. Fabre d'Olivet was a theosophist, who speculated that the meanings of the Book of Genesis could be accessed via linguistic analysis of Hebrew. Whorf found his work notably worthy with regards

to the contrastive methodology it followed in treating Hebrew letters which, according to the French thinker, each bore a semantic value. This quest for non-apparent, yet inherent, meanings through contrastive analysis was later to characterise Whorf's work. Historically, Fabre d'Olivet's essay sparked a novel interest in linguistic study, which Whorf was never to abandon. From 1924 onwards, Whorf proved a keen linguistic enthusiast. By 1926, he started his study of Nahuatl (Aztec language), and by 1928, started working on Mayan hieroglyphs. In the meantime, he had started limited correspondence with academics at Harvard and at the Brooklyn museum. Despite these exchanges, Whorf largely remained untutored in his learning. He nonetheless managed a first conference talk and a first publication in 1928, and obtained a research fellowship in 1930, which financed a fieldtrip to Mexico. It was only in 1931, when Sapir obtained his Yale professorship, that Whorf was really able, for the first time, to interact with the great Boasian linguist, Sapir. He enrolled on Sapir's course on Amerindian linguistics, and finally received academic tutoring, which permitted him to become familiar with linguistic theories and empirical methods, and also with a range of Sapir's influential students.

The name of B.L. Whorf is to this day the most famous of all to be associated with linguistic relativity, though explicit mention of 'linguistic relativity' appeared in his writings only eighteen months before he passed away (Lee 1996: xviii). Furthermore, the ideas associated with the role of language in cognition are not explicit prior to 1935, barely six years before his death – the last three years of his life were spent battling with chemotherapy and cancer. Sapir, as already mentioned, had also talked of relativity before Whorf, yet Whorf was the one to make a formal articulation of the principle of linguistic relativity (1956: 214 & 221). Needless to say, Sapir exerted considerable influence on the direction of Whorf's thinking over their short-lived seven years of interactions (Trager 1942: 1), and it may be doubted whether Whorf would have developed his linguistic understanding in a relativistic way were it not for Sapir's input (Carroll 1956: 26). Nonetheless, Whorf's research is most often considered the starting point of modern linguistic relativity, for indeed, his linguistic arguments on this topic came to be very elaborate, as well as richly documented with cross-linguistic data. His work, like Humboldt's, was also a synthesis and a further refinement of his immediate predecessors' insights.

Like Sapir and other Boasians, Whorf embraced a holistic understanding of language; that is, he assumed language to be a part of culture and to be emergent from human interactions within a specific socio-cultural locus. In other words, language is a collective artefact and its usage is a matter of agreed-upon conventionalisation. Successful communication is guaranteed if and only if each language-user complies with the established sets of rules and codes in place

in a particular community, at a particular point in time. Therefore, any atomistic approach peeling language apart from its human, socio-cultural embedding is in vain, for this anchorage defines the very essence of language.

Added to this sociolinguistic inclination, Whorf equally acknowledged Boas's fundamental contribution concerning the classificatory nature of all human languages, and he also emphasised Sapir's structuralist notion of grammatical patternment – both aspects deriving from human cognitive abilities:

We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organised by our minds – and this means largely by the linguistic systems in our minds. We cut nature up, organise it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organise it in this way – an agreement that holds throughout our speech community and is codified in the patterns of our language. The agreement is, of course, an implicit and unstated one, BUT ITS TERMS ARE ABSOLUTELY OBLIGATORY; we cannot talk at all except by subscribing to the organisation and classification of data which the agreement decrees (Whorf 1956: 213-4).

These basic foundations entailed his agreement with his predecessors on the fact that linguistic diversity illustrates divergent classifications of experience. From there on, Whorf concentrated much attention on the patterning of these classifications, as, like Sapir, he adopted a functionalist view of languages as meaning-making systems using structured morphosyntactic relations to fulfil their semantic purpose:

Linguistics is essentially the quest of MEANING (ibid.: 73).

Any scientific grammar is necessarily a deep analysis into relations (ibid.: 68).

In the domain of linguistic categories, Whorf reiterated Sapir's (and Boas's) interest in obligatory categories, i.e. what must be said as opposed to what may be left unsaid:

The province of a certain grammatical class in one language may be a mere unexpressed nuance in another, in a third it may be a nuance expressed entirely by prosodic features, stress, loudness-emphasis, intonation, etc. (Whorf & Trager 1938: 9).

Yet, he offered a genuine contribution by establishing a useful distinction between *overt* and *covert* categories. An overt category is typically always marked, e.g. English plural as marked by the nominal suffix -s, the use of articles and the verb ending:

An overt category is a category having a formal mark which is present (with only infrequent exceptions) in every sentence containing a member of the category (Whorf 1956: 88).

On the other hand, a covert category is only marked on an ad hoc basis, e.g. English nominal gender, as in *the boat* (she), *my dog* (he/she/it), etc.:

A covert category is marked, whether morphemically or by sentence-pattern, only in certain types of sentence and not in every sentence in which a word or element belonging to the category occurs... this word belongs to a class requiring some sort of distinctive treatment, which may even be the negative treatment of excluding that type of sentence (ibid.: 89).

Whorf elaborated his argument further by referring to the grammatical meaning of each category, which he labelled *phenotypes* and *cryptotypes* respectively:

Grammatical classes which appear ordinarily 'without' markers do have markers appearing with them under certain particular circumstances – such a class is 'covert', and its marker is a 'reactance'. Its grammatical meaning, if distinguishable, is a 'cryptotype'... *Overt* categories are accompanied by markers in all or nearly all sentences... Their grammatical meanings are 'phenotypes' (ibid.: 5).

Like Boas and Sapir before him, Whorf sought to frame his understanding of grammar within the wider study of human psychology. In this regard, he acknowledged Sapir's teachings on the systematicity of language, whereby speakers' unawareness of linguistic structures entails that the meanings emerging from these structures exert an influential conditioning on conceptual thinking – referred to as 'habitual thought' by Whorf (e.g. ibid.: 134-59). In this light, his eventual proposal with regards to the relation of grammatical categories to habitual thinking was that overt categories and their phenotypic semantic import are more explicit and hence more accessible to speakers' consciousness than covert categories and their cryptotypic meanings. In other words, phenotypes are available to metalinguistic awareness and, as such, can only exert a limited influence over unconscious, habitual thinking. On the other hand, cryptotypes, because of their "hidden" and "elusive" nature (ibid.: 105), are not readily available to the metalinguistic conscience and are therefore prone to derive a more considerable influence on unconscious, habitual thinking:

The covert classes may have a far-reaching connection with the type of thinking, the 'philosophy' or 'implicit metaphysics' of a [language]... The manifestations of these class-distinctions in thinking and the character of the sometimes rather deeply-hidden and seldom-appearing reactances suggest the phenomena associated with the unconscious, subconscious, or foreconscious in psychology, though on a more socialised and less purely personal plane, and may connect in a significant manner therewith (ibid.: 5).

From the phenotypic/ cryptotypic distinction, Whorf further deduced a phenomenon of categorial salience as an intrinsic property of language items and relations at the level of morphosyntactic meaning, i.e. overt categories have more salience because they are more readily manifest to speakers' awareness than are covert categories. As already noted, Whorf

equally embraced the understanding that linguistic behaviour is systematic and ‘unconscious,’ to use his phraseology. The notion of awareness is deductively connected to the one of salience. To summarise schematically:

Table 2.1. Grammatical categories, meanings & salience levels.

Marking	Obligatory	Non Obligatory
Category	Overt	Covert
Grammatical Meaning	Phenotype	Cryptotype
Salience	Maximum	Minimum

For Whorf, the fact that speakers must comply with rules of obligatory/ optional marking in order to achieve successful communication does not raise to their consciousness because of the acquisition of language at such an early stage in conscious life,¹⁰ and because of the therefore high systematicity of linguistic production and reception – what Whorf (*ibid.*: 238) referred to as “the effortlessness of speech and the subconscious way we picked up that activity in early childhood.” Implicit in this assumption, yet equally important, is, as Grace (1987: 121) notes, the fact that “language can introduce the child to elements of the world long before the child has encountered them in real life.” Whorf essentially believed that language knowledge is embodied in that it is acquired through the experience of enculturation, whereby it becomes part of cognition – a conception anticipating Bourdieu’s (1991) experiential understanding of the linguistic habitus. In Lucy’s words (1992a: 46), Whorf’s experientialism entailed the “cognitive appropriation of linguistic analogies,” whereby cognition is moulded simultaneously by natural and by construed frameworks of life, that is, by biology and environment, alongside culture and language.

Having refined a theoretical framework for the analysis of grammatical categories, Whorf then showed that an overt category in one language may be covert in another language, e.g. nominal gender is overt in Latin, but is covert in English (1956: 90). He further illustrated that the complexity and number of covert categories vary from language to language. Therefore, cross-linguistic differences in the distribution of category types are pervasive, both quantitatively and qualitatively. This differential distribution of grammatical categories across languages logically entails the cross-linguistic variation in the salience of the corresponding semantic values expressed. Put more plainly, this categorial distribution requires speakers of different languages to pay attention to differing aspects of the same reality and to do this to varying degrees, in the process of communication. As an example, the table below suggests how

¹⁰ See Lee (1996: 29) for a parallel between Whorf and Vygotsky.

certain features of reality – at times to be found in the knowledge of the cultural environment – must be attended to in communicating in different languages:

Table 2.2. Illustration of the relative distribution of grammatical marking across languages.

	English	French	Japanese	Chinese
Honorific reference	Optional	Obligatory (basic)	Obligatory (elaborate)	Optional
Tense	Obligatory	Obligatory	Obligatory	Optional
Nominal number	Obligatory for nouns only	Obligatory for nouns and adjectives	Optional	Optional
Nominal gender	Optional	Obligatory	Optional	Optional

It is precisely in the differential patternment of linguistic salience that Whorf imagined varying construals of the world as delineated along the borders of linguistic communities, as explained further below.

As mentioned earlier, Whorf’s grammatical analyses revolved around the central search for meaning, which he located at the sentence level, where a lexico-morpho-syntactic ‘rapport’ is identifiable:

Sense or meaning does not result from words or morphemes but from patterned relations between words and morphemes... It is not words mumbled, but RAPPORT between words, which enables them to work together at all to any semantic result (ibid.: 67-8).

In line with Sapir’s teachings, the structural organisation of linguistic systems is crucial to Whorf’s theory of meaning and to his empirical approach. Like his tutor, Whorf adopted a holistic understanding of meaning as emanating from the relational patternment, or rapport, between phenotypes and cryptotypes:

Linguistic meaning results from the interplay of phenotypes and cryptotypes (ibid.: 72).

Meaning is not to be found in isolated units, as also asserted in Sapir’s structural understanding of the fulfilment of language functions. Rather, meaning is an interactional and emergent construct abstracted from structural patterning – an understanding which is both pioneeringly connectionist and reminiscent of 18th-century organismic conceptions of language.

The central idea of meaning emerging from grammatical patternment runs alongside Whorf’s further understanding of ‘thought worlds’ emerging from linguistic systems as embedded in cultural frameworks. Influential in the development of his arguments was the

growing field of Gestalt psychology, which Whorf widely acknowledged as most inspirational (e.g. *ibid.*: 160-72) – especially through the work of Koffka (1935) (1886-1941). Gestalt theory had already been mentioned by Sapir before Whorf, and it is no coincidence that we should find the translation of *Gestalt* – configuration – so pervasive in Sapir's writings. The essential point in Gestalt psychology is that

certain processes universally available to human beings organise the data of primary experience (Lee 1996: 102).

More generally, a central tenet is that perception of the environment operates at the molar, rather than at the molecular, level. That is, perception abstracts wholes out of atomistic givens. This principle is well known, for instance, in visual cognition so that painted dots or incomplete drawn lines can be construed as whole pictures by the human eye. This perceptual possibility essentially depends on the properties of that 'human eye,' so that if it were removed, nothing of the picture would be perceivable – to the extent that the picture would simply not *be*. In other words, the conceptualiser – and its cognitive, physical, and physiological properties – is the central determinant of perceptions. This notion is central to relativity arguments – whether in linguistics, psychology, or physics. In linguistic relativity, a *vision field* metaphor applies equally well, so that perception of the environment abstracts whole worldviews – or at least 'semantic visions,' or understanding, at the immediate sentence-level – out of linguistic unit patterns. As with painted dots and incomplete line drawings, the conceptualiser is still capable of abstracting meaning out of incomplete sets of linguistic units, e.g. incomplete sentences, as occur predominantly in spoken language. However, linguistic units are incidental to the overall outlook. Rather, the fundamental abstraction of given wholes depends on the arrangement, or patterning, of the units. This idea, first elaborated from Sapir's linguistic structuralism, was central to Whorf's insistence on the notion of grammatical patternment out of which meaning becomes emergent:

It is not so much in these special uses of language as in its constant ways of arranging data and its most ordinary everyday analysis of phenomena that we need to recognise the influence it has on other activities, cultural and personal (Whorf 1956: 134-5).

Such an understanding led Whorf to a dual conclusion on 'semantic vision.' First, patternment of linguistic units at the 'on-line' level of language production and comprehension gives rise to local meanings purporting to the immediate environment; and second, patternments of language-specific units at the abstract, all-encompassing, molar level give rise to pseudo-ontological meanings purporting to the world at large. In other words, linguistic patternment enables visions

of understanding at the micro-level of the here-and-now of referentiality, as well as at the global level of the 'metaphysical worldview' as depicted by the linguistic reality framework:

Every complex of a culture and language... carries with it an implicit metaphysics, a model of the universe, composed of notions and assumptions organised into a harmonious system... the total picture is never given explicitly, not even in a grammar, but is a complex semi-conscious thought form which is taken for granted, and acted upon without being brought into the front of consciousness for scrutiny (Whorf & Trager 1938: 8-9).¹¹

This understanding of Whorf's ideas is widely acknowledged in the literature. Yet, as such, it remains vulnerable to controversy, in that this understanding allows for divergences in 'visions' *ad infinitum*. Most often neglected, yet equally important, is the above-mentioned centrality of the conceptualiser. As noted, there is no vision without an eye. Further, if the quality of different eyes is the same, the resulting vision will equally be the same, unless outside variables (e.g. light, angle, etc.) skew the similarity of the perceptual reconstruction of the image. This Gestalt understanding was also incorporated into Whorf's linguistic relativity, so that visualising divergences are limited by human potential – in this case conceptual potential. This position further entails that, so long as the conceptualiser is human, any semantic and metaphysical vision is equally accessible by all – given the practical availability of linguistic variables. Whorf's approach to human cognition and behaviour was therefore always faithful to the Boasian theme of the psychic unity of mankind.

Finally, Whorf's work also bore the Boasian stamp in its empiricist epistemology. Like Boas's, and later Sapir's students, Whorf implemented fieldwork among native speakers of non-Indo-European languages. Whorf's overall contribution to linguistics must also be appreciated in the light of the constant documenting of his ideas with diverse and detailed comparisons of data from English, German, French, Nahuatl, Uto-Aztecan, Mexican, Mayan, Hopi, Shawnee, and more. Whorf, however, did not contend with simply applying his masters' knowledge, but he questioned it and engaged himself in methodological discussions on the nature of linguistic fieldwork. One of his eventual aims was to develop a thorough methodology for the configurative study of meaning.

Like Sapir had stressed before him (e.g. 1985: 159), Whorf insisted on the need for comparative data from different languages, because a focus on only one language fails to reveal the true extent of differences and similarities between languages, as well as it fails to reveal the extent of human symbolic potential. Linked to this point is the further trap of linguacentrism.

¹¹ Recall the point made earlier regarding Whorf's dismissal of the sole responsibility of language to construe a worldview. Rather, it is the intermeshing of all symbolic resources with the complete environment, including culture, which determines perceived realities.

Indeed, if the Whorfian postulate has any element of truth, then a one-language-only focus would fail to show the analyst the artificiality of the constructs of his/ her own language. Whorf's claim is that the linguist ought to beware of the perceived naturalness of his/ her mother tongue – in the same sense that the ethnographer ought to bring his/ her own native cultural constructs into the forefront of awareness so as to avoid ethnocentrism. This point regarding the need for the objectification of linguistic and cultural values had already been made by Boas and Sapir during their discussions concerning the phonetic perception of speech sounds. Whorf extended this point to encompass the entire patternment of meanings present in language and the perception of emerging worldviews, so that

the difficulty of appraising such a far-reaching influence is great because of its background character, because of the difficulty of standing aside from our own language, which is a habit and a cultural *non est disputandum*, and scrutinising it objectively. And if we take a very dissimilar language, this language becomes a part of nature, and we even do to it what we have already done to nature. We tend to think in our own language in order to examine the exotic language... Yet the problem, though difficult, is feasible; and the best approach is through an exotic language, for in its study we are at long last pushed willy-nilly out of our ruts. Then we find that the exotic language is a mirror held up to our own (Whorf 1956: 137-8).

The problems posed by linguacentrism further reach into the analyses and reporting of linguistic findings and the study into relations between 'fashions of speaking' and cognition, because means of reporting and analysing are also linguistic by nature, and are therefore subject to the linguist's native language classifications which may be inadequate in their interpretative classifications for the explanation of ethnolinguistic data (e.g. *ibid.*: 162). Like Herder before him, and Lucy fifty years later, Whorf insisted on the need for a neutral instrument, and possibly a metalanguage, capable of describing reality objectively, without the culturally-loaded burden of subjective meanings offered by natural languages:

In describing differences between [languages]... we must have a way of describing phenomena by non-linguistic standards, and by terms that refer to experience as it must be to all human beings, irrespective of their languages or philosophies (Whorf & Trager 1938: 6).

This 'way of describing phenomena by non-linguistic standards' Whorf believed to have found in Gestalt classifications of experiential essentials, e.g. in terms of grounds, figures, egoic field, and the like:

A discovery made by modern configurative or Gestalt psychology gives us a canon of reference for all observers, irrespective of their languages or scientific jargons, by which to break down and describe all visually observable situations, and many other situations, also (Whorf 1956: 163).

These configurations are particularly adequate because they represent perceptual universals, independent of linguistic and cultural constructs. Whorf was keen, in this respect, to exploit human universals for the study of diversity:

To say that the facts are essentially the same for all observers is not to deny that they have their fringe of aberrations and individual differences, but these are relatively minor... The FACTS may differ slightly; the LAWS are the same for all (ibid.: 163-4).

Whorf thus advocated the application of universal Gestalts of perception to the analysis of linguistic elaborations of isolates of experience. Whilst acknowledging perceptual universals and linguistic symbolisms, Whorf also integrated the study of cultural values into his methodological outline. As mentioned before, Whorf believed that worldviews are articulated by linguistic means of reference *together with* (non-linguistic) cultural aspects of life (e.g. ibid. 147). Whorf therefore argued for careful ethnographic work in any study attempting to unravel native 'thought worlds,' or 'cultural mentalities.' The combined study of this 'vast summation' of factors entails that

as the science [of linguistics] refines its procedure, it inevitably becomes, as a matter of this quest [for meaning], more psychological and cultural, while retaining that almost mathematical precision of statement which it gets from the highly systematic nature of the linguistic realm of fact (ibid.: 79).

Whorf's methodological guidelines for the study of configurative linguistics comprised three major tenets, (i) an overall ethnographic appreciation of the native cultural values, (ii) an in-depth study of the native linguistic symbolisms, patternments, and meanings, and (iii) an awareness of one's own ethnocentric and linguacentric legacy:

To appreciate [another pattern of symbolism] we must not only know the culture but perform two operations of linguistic nature: (1) disabuse ourselves of the effect of our own literary language in its allusions... (2) assimilate the native linguistic patterns, segmentations and meanings that are tied in with the native employment of the symbolism (Whorf & Trager 1938: 14).

By adopting an empiricist epistemology of the above kind, Whorf demonstrated both great methodological discernment and insightfully pioneering intuitions, for the above points are to this day – some sixty years on – still paramount to scientific rigour and argumentative validity in linguistic and in ethnographic work.

To summarise, Whorf's work concentrated on a psychological understanding of the patternment of grammatical categories. He analysed verbal categories as symbolic referents to isolates of experience, seeking to identify which facets of those isolates are highlighted and which are backgrounded in linguistic expression. Because Whorf examined at broad categories of reference and general isolates of experience, e.g. time, space, motion, quantity, etc., he was

able to extrapolate metaphysics at large. The matter would have been different had Whorf concerned himself with minor, isolated referents, such as conceptions of 'snow' or 'colour' types and the like – which are experiential domains too restricted in nature for the elaboration of a comprehensive view of the universe. Together with Sapir, he agreed that these isolated lexical referents were cultural particulars of limited insight. Instead, he concentrated on experiential fundamentals, as found to articulate each individual's existence on a daily basis – based, again, on the cognito-physiological nature of human creatures.

Departing from the formal completeness of language as a semiotic system, Whorf further sought to demonstrate that symbolic categories, as found in language, are not calques to the objective outer world, but rather they are interpretative representations of it:

A category... is an attempted interpretation of a whole large order of experience, virtually of the world or of nature (Whorf 1956: 137).

Further assuming the systematic and unconscious nature of language use, and its arbitrary distribution of patterns of semantic salience on a cross-linguistic plane, Whorf concluded that speakers take linguistic meanings to be a true reflection of the concepts present in isolates of experience and in the wider world:

we always assume that the linguistic analysis made by our group reflects reality better than it does (ibid.).

In so doing, speakers legitimately confuse the objective world with their linguistically-mediated subjective reality. Each language builds a specific worldview which inevitably distorts the 'real' world by the very elaboration of its interpretation through a human lens, which is made further complex by varying symbolic resources. A worldview is essentially a mental assemblage of interconnected concepts and meanings – concepts being arranged, objectified, and categorised in the mind by language, and being further elaborated by cultural relevance. Yet, a worldview is not merely the realisation of a conceptual understanding of life, but also a behavioural guide to life, i.e. it embodies ways to think about the world, as well as ways to *be* in the world. Whorf (e.g. *ibid.*: 134-59) thus further contended that our linguistically-construed worldviews are also guides for individual behaviour:

the cue to a certain line of behaviour is often given by the analogies of the linguistic formula in which the situation is spoken of, and by which to some degree it is analysed, classified, and allotted its space in [the] world (*ibid.*: 137).

Whorf's notion of linguistic relativity was the eventual culmination of his theoretical and empirical work on grammatical systems combined with his understanding of psychology – especially the Gestalt tradition – and as such, it should not be surprising therefore that he

developed his relativistic arguments in the last few months of his life and career. His original enterprise had been the purely linguistic task of studying cross-linguistic grammatical systems – with an emphasis on the patternment of categories – in order to decipher the semantic matrices of unrelated languages. The intellectual context of his time led him to relate the study of language to both anthropology – with its focus on native perspectives of the world – and psychology – with its focus on the symbolic characteristics of the human mind. In addition to this academic environment, his own theoretical understanding (mainly achieved through Sapir’s tutoring) and his extensive empirical research led Whorf to an all-too-commonsensical appreciation of the unavoidable role of linguistic and cultural systems in individual and collective cognition:

Every language is a vast pattern-system, different from others, in which are culturally ordained the forms and categories by which the personality not only communicates, but also analyses nature, notices or neglects types of relationship and phenomena, channels his reasoning, and builds the house of his consciousness (ibid.: 252).

Considering his short-lived academic career, Whorf’s contribution to linguistics and the social sciences is massive. His ideas may not have been refined to their final potential, yet they are illuminating enough to suggest clear directions of study in grammatical theory, typological work, linguistic fieldwork, cultural understanding, the philosophy of language, linguistic processing, the psychology of language, and research methodology.

2.3. POST-WAR RESEARCH & ACADEMIC DEPARTMENTALISATION

Boas, Sapir, and Whorf all died around 1940. In 1939, the Second World War struck in Europe, and soon paralysed the rest of the modern world. It suspended most intellectual and artistic activities for years to come, and revolutionised ideologies.

In the 1950s and 1960s, linguistic relativity was investigated by linguists, anthropologists, and psychologists on a somewhat disparate basis. These various scholars adopted rather different assumptions from those espoused by Sapir and Whorf, and their studies proved to be of a less rigorous methodological quality (see Lucy 1992a for a comprehensive review and criticisms).

Paralleling this line of research, the 1960s witnessed a new growth of universalism and nativism in linguistic and cognitive studies (e.g. Chomsky 1957, 1965). The point is not that universalist theories need be antithetical to relativism – as has been shown already by Humboldt, Boas, Sapir and Whorf – but, rather that the vigour with which the universalist movement imposed itself on the field of linguistics at the time set an enormous challenge to the foundations and equilibrium of the relativist enterprise. By the same token, it entirely changed the direction

of focus for linguistic research, away from empirical ethnographic data towards abstract quasi-mathematical theorising. In short, historical and intellectual circumstances assured the latent decline of the Boasian tradition.

Also in the same period, Whorf's principle of linguistic relativity was relabelled the 'Sapir-Whorf hypothesis' (see Alford 1995: 1). As mentioned above (in section 1.3.), this entailed rather unfortunate implications:

- (a) Whorf's principle was no longer considered an axiom of study but turned into a hypothesis to be empirically tested – this turn struck a painful blow to the validity and credibility of relativist foundations (this blow can still be felt today, fifty years on, as relativists are regarded as credulous and somewhat romantically naïve), and
- (b) relativity was reformulated entirely, lumping Sapir and Whorf together – this reformulation extrapolates both Sapir's and Whorf's writings; it presents two versions of linguistic relativity: (i) a strong version claiming that language determines thought, and (ii) a weak version claiming that language exerts an influence on speakers' perception and construction of reality.

Needless to say that with the new rise of rationalism and structuralism in the post-war years, the deterministic version of relativity came to be seen as lunatic speculation – to the extent that the name of Whorf, in particular, has grown somewhat taboo and polemical in linguistic departments adopting Chomskyan tenets.

The following sections will briefly review a few studies led in the 1950s and 60s, which are, nonetheless, worth mentioning (see section 3.3. for post-1960s research on linguistic relativity). A characteristic of this academic period, however, is the departmentalisation of disciplines. As seen above, the Romantics, the Boasians, as well as Whorf, all embraced a fundamentally holistic and interdisciplinary approach to the study of language. Indeed, linguistic relativity entails the correlated study of individual patterns of cognition (i.e. psychology) and of collective worldviews (i.e. anthropology) to the facts of language (i.e. linguistics). The relativistic studies of the post-war years, however, emerged out of different fields of research, namely anthropology, psychology, and linguistics.

2.3.1. ANTHROPOLOGICAL LINGUISTICS

Researchers in the anthropological tradition focused on language and culture in order to study the worldview of a people. Notable researchers were Dorothy Lee (1940a and b, 1944, 1950, 1959), Harry Hoijer (1948, 1951, 1953, 1954) and Madeleine Mathiot (1962, 1967, 1968, 1969). The theoretical arguments made in their research are generally faithful theoretical extensions of Whorf's ideas, and remain relevant to this day. In accordance with Whorf's methodology, these scholars all conducted comparative ethnolinguistic studies focusing on the analysis of meaning, departing from English and contrasting unrelated languages, e.g. Wintu, Navaho, Papago. They

also examined language at the structural level of morphosyntactic relations, e.g. number-marking, subject-predicate relations, spatial expression.

However, their empirical work proved inadequate for providing linguistic relativity with any form of conclusive support. For one thing, a priori ethnolinguistic frameworks were predominantly used for the study of non-Indo-European languages and cultures. Therefore, linguacentrism pervaded most of these studies. Furthermore, no non-linguistic data of a psychological, behavioural, or purely cultural type were examined, rendering their research solely linguistic and therefore irrevocably circular. Mathiot's work, for instance, assumed grammar to be the essential characteristic of languages, and lexicons to be purely cultural, and thus non-linguistic; whilst Lee's work on Wintu failed to examine cultural data of any kind:

The Wintu Indians of northern California have a conception of the self which is markedly different from our own. I have attempted to arrive at this conception through analysis of linguistic form and structure, as well as consideration of biographical texts and recorded mythical material. My study is incomplete, since I have no other record of actual behaviour. The ethnography of the Wintu as we have it, is an account of a dead and remembered culture (Lee 1950: 538).

Furthermore, Whorf's careful characterisations of semantic resources, emerging meanings through rapport, concepts, Gestalts, and isolates of experience, are blurred together in an unclear and oversimplified equation of semantic and conceptual representations:

In the cognitive analysis of a given aspect of language, the semantic distinctive features of that aspect are the basis for inferring its cognitive content (Mathiot 1967: 201).

A final source of flaws resides in the inconsistent divergence, and often incomplete, state of the linguistic analyses – not to mention their occasional inaccuracies. With the compartmentalisation of disciplinary expertise, such inconsistencies and inaccuracies proved fatal to any form of serious and sympathetic consideration of the original arguments.

In a modern perspective, the vulnerability of the linguistic anthropologists resides in their assumption of the existence of a relation between linguistic data and non-linguistic manifestations, as a result of which their work remained largely correlational, intuitive, and inconclusive. As such, the linguistic anthropological tradition of the post-war years cannot be considered a truly valuable contribution to linguistic or, indeed, cultural relativity. On the contrary, the inadequacies of their linguistic analyses combined with their circularity of argumentation did much to promote a negative outlook on Whorfian tenets.

2.3.2. ETHNOGRAPHY OF COMMUNICATION

The ethnography of speaking (or, communication) started in the early 1960s under the impetus of Dell Hymes (see e.g. 1961, 1962) and has remained an active field of research to this day.

The ethnography of speaking tradition was a unification of two sub-fields, anthropological linguistics (in anthropology) and sociolinguistics (in dialectology), around the central theme of language use. The tradition deserves special attention here as its enterprise assumes a sociolinguistic orientation which was present in neither anthropological linguistics nor psycholinguistics (see section 2.3.3.) – yet which was a fundamental inclination explicit in the writings of both Sapir and Boas.

This orientation was made clear in Hymes's 1966 paper, which highlighted how different cultural groups use language differently although the language is the same. Hymes thus introduced the idea of intralingual relativism. He contrasted two types of relativity, (a) functional relativity, based on the uses of language, and (b) structural relativity, based on the grammars of languages (i.e. Whorf's relativity):

Theoretically prior [to Whorf's linguistic relativity] is a relativity that has to do with the use of language. The notion of a second type of linguistic relativity calls attention to differences in cultural pattern, and to their importance for linguistic experience and behaviour (Hymes 1966: 114).

His postulation of a second, yet *prior*, type of relativity was an implicit criticism of Whorf's postulate, which he took as being too generalising. Hymes's contention was that

the cognitive significance of a language depends not only on structure, but also on patterns of use (ibid.: 116).

So, Hymes's aim was first to study functional relativity. From a functional understanding of semantic patterns, the existence of potential similarities across all patterns of use within a speech community could be established. Only then could structural relativity be investigated on the basis of these immutable patterns. Hymes's position is all the clearer when comparing his calque of Sapir's famous statement:

People who enact different *cultures* do to some extent experience distinct *communicative systems*, not merely the same *natural communicative condition* with different *customs* affixed (ibid., emphasis added).

The *worlds* in which different societies live are distinct *worlds*, not merely the same *world* with different *labels* attached (Sapir 1985: 162, emphasis added).

This interesting parallel illustrates the differing orientations adopted by Hymes on the one hand, and by Sapir and Whorf on the other hand. Whereas Sapir (and later Whorf) took language and worldview as their central focus for analysis, Hymes chose to study (a) the functions of communication and culture, and (b) "the connection between linguistic pattern and the rest of culture" (Hymes 1966: 123). His empirical research reflected this different axis of study, as he investigated cultural attitudes in bilingual practices, ideological reflections of a cultural nature in

language use, or again the enactment of cultural norms through discourse patterns. For Sapir and Whorf, therefore, worldview is made relative due to language, whereas for Hymes, communication is made relative by culture. Hymes – like Boas in some respects – thus advocated cultural relativism, and as such did not directly pursue the Whorfian enterprise.

2.3.3. PSYCHOLINGUISTICS

In the same way that anthropologists brushed aside the domain of ‘habitual thought’ to focus on language and culture, psychologists considered culture as secondary and set out to investigate the relation between language and cognition more directly. The research in this tradition was inaugurated by Lenneberg (1953) and his colleagues (cf. Brown & Lenneberg 1954, Lenneberg & Roberts 1956), and it later developed under an altogether different and comparative angle with Brown (1957, 1958), Carroll (Carroll & Casagrande 1958), Casagrande (1960), and MacLay (1958), amongst others.

Lenneberg established a research agenda seeking to investigate the existence of an interactive relationship between language and cognition, which distorted the Whorfian project in a number of respects. First, Lenneberg examined intellectual potential and cognitive processes of a neurophysiological nature, rather than habitual or conceptual thinking:

The republication of Benjamin L. Whorf’s articles... has aroused a new interest... in the problem of the relationship that a particular language may have to its speakers’ cognitive processes. Does the structure of a given language affect the thoughts (or thought potential), the memory, the perception, the learning ability of those who speak that language? (Lenneberg 1953: 463).

Second, Lenneberg did not concern himself with the study of meaning:

the only pertinent linguistic data in this type of research is the HOW of communication and not the WHAT. This HOW I call the codification; the WHAT I call the messages... meaning can be excluded entirely from our research, at least theoretically, and we have therefore an assurance that we are actually studying aspects of codification (ibid.: 467).

Lenneberg’s work, therefore, did not examine grammatical patterns and their derived semantics. Instead, he (and his colleagues) focused on lexical items, especially relating to the domain of colour codification. Finally, Lenneberg developed an “intra-cultural approach” (ibid.: 468), hence dropping any contrastive analysis of cross-linguistic and cross-cultural differences.¹²

¹² These choices seemed to have been based on a principle of convenience, as one of Lenneberg’s colleagues explained: “Eric and I picked a lexical contrast rather than a grammatical one to work with because it looked simpler and because we had neither the means nor the impulse to travel to one of the Indian reservations in the Southwest. We planned to test Whorf’s hypothesis *within one language: English*” (Brown 1976: 128). It should not be so unfortunate that the research paradigm they triggered developed to the vast extent that it did, as it actually is when considering that it departed from the will to explore Whorfian ideas but eventually misrepresented those ideas to the academia of the 1950s and thereafter.

Lenneberg's work was also the starting point for subsequent studies on colour terms. Although the colour tradition became rather substantial, it sterilely focused – by its very nature – on visual cognition, which ought to be 'the same for all observers,' so long as the observer is physiologically human. It is worth mentioning, however, that colour cognition has been shown in recent years to be determined by cultural parameters, besides neurophysiological factors (e.g. MacLaury 1986, Lucy 1997a). However, a central concern remains, as rightly highlighted by Lucy (1996: 45), that "a half-dozen colour terms is a rather poor representative of language" in the study of 'language, thought, and reality,' as well as being a very restricted domain of potential cross-cultural and cross-linguistic variation.

Meanwhile, other psycholinguists (cited above) pursued Whorf's work and focused more readily on grammatical categories and meaning. These studies are perhaps the most interesting ones. They strove to conjugate both the anthropological and the psychological traditions, and were mostly comparative in nature. The main weakness, however, in these works is an overall lack of analytical rigour – both psychologically and linguistically. Brown's research, for instance, was not comparative and failed to obtain non-linguistic data to correlate with the grammatical categories he focused on. Carroll's work, on the other hand, examined ad hoc lexical categories (i.e. not constituting any structural or functional patterns), hence rendering his comparative endeavours somewhat vacuous as "there is no way to predict when such language classifications will be used in thought or how important their use might be" (Lucy 1992a: 198). Furthermore, his experimental efforts involved extensive task pre-training and his analytical results, at first inconclusive, had to be manipulated to yield statistical significance. This not only suggests that responses were unlikely to be spontaneous, but also that the conclusions eventually reached cannot be judged reliable. Casagrande's studies restored a focus on specific grammatical categories. However, although the study was comparative, linguistic analyses were provided for one language only, and they further failed to be completely clear about the importance and overall pervasiveness of the patterns under focus. Lastly, Casagrande's work examined children's performance only and the tests were not applied to adult subjects for an evaluation of lasting language effects on non-linguistic behaviour. Finally, Maclay's research reproduced Casagrande's with adult speakers of three unrelated languages. Yet, like Casagrande's, his work failed to provide systematic linguistic descriptions for the languages in question – both structural and functional; and his research failed to obtain different results for the cognitive performance of participants in all three language groups.

All the above methodological imperfections yielded ambiguous results and, overall, failed to provide any empirical support for the Whorfian paradigm. However, these studies helped to

reach a better understanding of methodological issues in the study of linguistic relativity. Cognitively speaking, they suggested novel experimental paradigms for the evaluation of non-linguistic behaviour. In addition, linguistically speaking, they eventually recognised the importance of thorough analyses of language structures prior to the hypothesising of cognitive and behavioural implications. Finally, they further acknowledged the functional relevance of the frequency of recurring patterns of language use, i.e. ‘fashions of speaking,’ in addition to the identification of grammatical patterns.

2.4. SUMMARY

The literature reviewed in this section illustrates but some of the ideas of only a sample of intellectuals who, over the past centuries, have pondered the question of the role of language in human cognition. The above selection has presented the scholars who have characterised the evolution of linguistic relativity in terms of the central arguments they articulated for this axiom of linguistic study and understanding, and allowed it to become thorough and well-grounded in its theoretical logic as well as productive in terms of its empirical implications. This review has revealed that interests in language and cognition were densely concentrated over the past two centuries, and that each generation of scholars contributed to the overall intellectual continuity of those interests, by refining and furthering the claims of their predecessors. This continuity eventually climaxed in 1940 when the principle of linguistic relativity was published for the first time in intellectual history, by Benjamin Lee Whorf. Oddly enough, this climax was followed by a stagnation in research quality and a subsequent decline in the mid-20th century, before being revived in the late 1980s and 1990s (see section 3.3.).

This section has therefore traced the development of linguistic relativity – or, ideas akin to linguistic relativity, prior to this appellation – as far back as Lucretius (99-55 BC), and more recently to 18th-century German Romanticism. Among the most notable German relativists, we may consider Herder a crucial pivotal figure, as he stood as a mediator between Hamann’s ideas and Humboldt’s, as well as his later successors’ (cf. Sapir 1907). His writings already displayed the basic ingredients for a theory of linguistic relativity as it eventually developed in early 20th-century writings. Thanks to Herder especially, Humboldt was able to develop an extremely thorough argument around the themes of language, thought, and reality. Humboldt’s main contributing points consisted of his combination of (a) a theoretical understanding of language as dynamic, social, symbolic and interactive, and (b) an empirical approach contrasting linguistic analyses of morphosyntactic patterns across unrelated languages, thereby applying his

very philosophical empiricism and transcending theoretical claims towards empirical documentation.

The crucial notion which developed out of 18th-century organismic philosophy and pervaded relativist writings – and nowadays to be found in cognitive approaches to modern linguistics (see section 3.3.2.) – is that of interconnection and interaction between all levels of language use and structure, and furthermore between language, thought, and worldview. In Aarsleff's words (1988: 24):

Language is like an immense fabric or web that displays the design of its worldview; it is a structure in which all parts are so intimately dependent that the whole forms an organism.

Despite epistemological continuity during the 19th century between the Romantic impetus and 20th-century linguistic relativity, genuine progress was not made before the arrival of the Boasians in American anthropology, especially through the work of Sapir and Whorf. Though ideologically and intellectually divergent, the Boasian approach to the study of linguistic diversity was very reminiscent of German Romanticism. Franz Boas however, of all the scholars reviewed, was not a relativist, at least not explicitly. Nevertheless, the importance of his work should not be underestimated as he made a major contribution to the progress of linguistic relativity. In this sense, Boas was a pivotal figure between the 19th and the 20th centuries. From a philosophical idea, linguistic relativity turned into a scientifically-spirited anthropolinguistic postulate for research. Although Humboldt had already conducted empirical studies, it was Boas who set the study of linguistic diversity and thought in the pseudo-scientific realms of anthropology, psychology, and linguistics. Taking a century-long step back, it appears that Boas unwittingly lent a helping hand in sowing the seeds, which Sapir and Whorf later went on to cultivate. In short, Boas's insights made it possible for Sapir to develop, and for Whorf to articulate, the principle of linguistic relativity as a modern linguistic axiom of study.

In their approach to language, Boas, Sapir, and Whorf emphasised usage in fashions of speaking, cultural context, and the centrality of meaning. They further complemented their functional and cultural understanding of language with an analysis of languages as formal systems. Sapir, especially, encouraged the development of American structuralism in linguistics, and his structuralism was centrally applied in Whorf's research on linguistic relativity. Such a structuralist understanding entails the recognition of a level of universality in the workings of natural human languages, and it is particularly relevant for an accurate understanding of modern linguistic relativity to remember that a blend of universalism and relativism pervaded Humboldt's writings as well as the work of his followers, Boas, Sapir, and Whorf.

In the decades following the deaths of Boas, Sapir, and Whorf, numerous studies relating to linguistic relativity were undertaken in the separate fields of linguistic anthropology, the ethnography of speaking, and psycholinguistics. However, many endorsed different assumptions and often parted from the Whorfian direction, not necessarily reaching any relevant conclusion in the end. Linguistic relativity was still a very novel area for research, and errors were perhaps only legitimate. These errors serve today to illustrate the necessity for a unified interdisciplinary approach to linguistic relativity, involving the fields of anthropology, linguistics, and cognitive science. They also point to the potential traps and obstacles that any researcher in this domain may encounter in their empirical journey. Although, at the time, these studies may have only weakened Whorf's theory through their circularity and inconclusiveness, today they prove to be the strength of contemporary research for the theoretical and empirical knowledge they provided (see Chapter 3); and in this sense, we may conclude that they have contributed to the improvement and progress of linguistic relativity.

CHAPTER 3. LANGUAGE IN THE MIND

The previous two chapters have now identified the focus of the present study as the nature of the triangular language-cognition-reality model inherent in language-based semiotic systems, as well as the dynamics and directions of its intrinsic relationships. Its empirical study must, therefore, incorporate linguistic, psychological and domain-based investigations. The aim of this thesis being to offer novel experimental facts in the further consideration of the validity of linguistic relativity, this section will now consider how to conceptualise and approach the exploration of language in the mind. To this end, the chapter outlines the modern contextualisation of the study of language as a set of cognitive processes. This understanding is espoused by cognitive scientists, and most notably by cognitive linguists. Their approach to language is most relevant to linguistic relativity due to its emphasis on the interconnectedness with psychological phenomena, and on its primary function of conveying semantic import. These fundamental points are concordant with Whorf's emphasis on "the quest of meaning" (1956: 73), and with the organismic view of language first adopted by the Romantic philosophers and later reiterated by Whorf and Sapir.

The current chapter begins with a section defining the nature of concepts, meanings, and grammar. This outline follows modern cognitive linguistics' conception of semantic and conceptual forms, leading to a discussion of language as a reality-construing tool.

Following this introduction to the modern position on language, the second section introduces modern neo-Whorfianism. In doing so, it offers an outline of the issues involved in studying linguistic relativity, that is, the points of methodological concern which experimenters need to consider, e.g. pitfalls, variables, subjects. The second part of this chapter then reviews three possible epistemological approaches to investigating the effects of the linguistic encoding of experiential domains on cognitive activities – each approach originating from one of the triangular points mentioned above, i.e. language, cognition, or reality. To summarise, it is suggested that possibilities for the experimental assessment of relativity are numerous, and that the most reliable epistemology of investigation may be the combination of two approaches simultaneously.

3.1. COGNITIVE SCIENCE

Over the past twenty years, academic disciplines have increasingly realised the needs and benefits of converging their expertise for a better understanding of their own specialities. Multidisciplinary endeavours have been especially notable in fields involved in the study of

human beings and, most importantly, the study of the mind, e.g. psychology, philosophy, linguistics, and anthropology. These disciplines do not only share their knowledge and epistemologies to understand human minds, but also to further understand those minds' conception of the world – what they variously label conceptual structure, reality construal, metaphysics, worldview, intersubjectivity, the emic perspective, or again the native's point of view. Similarly, linguistic relativity is an interdisciplinary topic of study uniting language behaviour with human cognition and the cultural dimension of human lives. Its aim is to investigate how linguistic meanings help define an individual's perspective of the world – at the individual and at the collective levels. Given this understanding, the aims of cognitive science and linguistic relativity are very congruent, and the modern field of cognitive science has been highly significant in the further development of linguistic relativity during the past decade.

More specifically, a particular branch of the cognitive sciences, namely cognitive linguistics, is of unique relevance to linguistic relativity, due to the fundamental claims made by cognitive linguists regarding the very nature of language. Indeed, cognitive linguistics defines its understanding of language as the study of meaning. It claims that linguistic structures reflect ways of referring to and conceptualising the world. Hence, cognitive linguists view language and cognition as integral to one another. Indeed, a basic premise in cognitive science is the assumption of a componential connectivity between cognitive functions, including those which are language-generating. Language is indeed posited as a cognitive faculty emergent from experiential interactions with the world and non-language-specific cognitive functions, e.g. perception, memory, categorisation, inference, attention, declarative knowledge:

languages are viewed as nothing other than sets of social conventions by means of which human beings communicate with one another about their experience. Human linguistic competence is thus composed of the same basic elements as many other cognitive skills... [e.g.] event cognition, categorisation, joint attention, and cultural learning (Tomasello 1998: 486).

From a linguistic perspective, cognitive linguists thus deny the strict independence of language components from general cognitive processes, especially with regard the autonomy of syntax (Langacker 1991: 265). Instead, cognitive linguistics places language components, e.g. semantics, lexis, pragmatics, syntax, phonology, on a *continuum* (ibid.: 61), with a (+) cultural extreme at which lexis is situated due its dependence on ecological factors, and with a (-) cultural extreme at which the more mechanical aspects of morphology and syntax are localised. Along this continuum, language components have no clear boundary delineating them from one another, but instead are restricted in their interactions on the basis of their intrinsic properties. The components can thus interact constantly with cognitive processes in a reciprocal manner,

i.e. the behaviour of one component affects the behaviour of other components. In other words, each component, or cognitive process, is *relative* to all other processes. Therefore, the cognitivist model unifies the machinery of language within itself across its components, and with cognition at large and its various functions:

the contributions of the components are minimised and the behaviour of the system results more from the interaction of components than the behaviour of the components themselves (Bechtel 1990: 254).

This emergentist approach is reminiscent of 18th-century organismic thinking, and echoes Sapir's "vast network of associated localisations in the brain" (1921: 10) and Whorf's "rapport" (1956: 67-8) in their views on linguistic organisation relative to cognition. The central idea is thus that all the components of the language-cognition system are interdependent and highly interactive, allowing for constant feedback between cognitive processes, resulting in non-linear processing. In cognitive linguistics, this idea is translated by a resultative equation of linguistic operations with cognitive processes:

most if not all of [linguistic] construal operations are special cases of general cognitive processes described in psychology and phenomenology (Croft & Cruse 2004: 45).

Such a position makes it possible and likely for the relationship between language and cognition to be a highly dynamic one in which both language and cognition are so closely intertwined that their respective properties condition each other to substantial extents. In fact, this position if taken to the extreme claims isomorphism between linguistic representations and cognitive processes (e.g. Langacker 1987), and is thus subject to deterministic interpretations (Levinson 1997).

The nature of linguistic operations, cognitive processes, and the equating of the two is addressed more fully in the following two sections. The remainder of the present section outlines the hermeneutic basis for conceptualising reality espoused by cognitivist tenets. This section aims at deepening an appreciation of the relevance of modern cognitive disciplines to relativistic arguments.

3.1.1. SEMANTIC & CONCEPTUAL REPRESENTATIONS

At a micro-level of understanding, cognitive processes enable the representation of concepts, and language operations enable the representation of meanings. It is at this micro-level that the present section attempts to elucidate cognitive claims regarding the understanding of language, cognition, and the standing relation between the two.

Cognitive linguists adopt a conceptualist understanding of language forms, and situate their focal object of study on linguistic semantics. In other words, language is about articulating

meanings, and linguistics is about studying semantics – as it was for Whorf half a century earlier. Furthermore, semantic representations are understood as conceptual representations:

Cognitive grammar therefore equates meaning with conceptualisation (Langacker 1987: 5).

In other words, linguistic meanings represent concepts – whether those meanings are encoded at the word level, or at the level of lexical expressions, grammatical relations and constructions, or morphological inflections. This position entails that cognitive linguists are equally interested in semantic representations expressed in linguistic forms, as they are in conceptual representations of a non-linguistic nature. This focus on concepts is reminiscent of Sapir who, decades previously, had emphasised the importance of characterising the relativity of concepts (e.g. 1985: 159), positing that

The material of language reflects... the world of concepts and... of images (1921: 38).

3.1.1.1. Images & Schemas

Given that language is hypothesised as a cognitive faculty emergent from general cognitive processes, cognition is the first item of study that cognitive linguists have tried to characterise insofar as its relevance to language is evident. At a micro-level of calibration, concepts have thus been a focal point of interest. A pertinent analogy often drawn by cognitive linguists, as it once was by Sapir, relates concepts to images in the mind. As with all analogies, it is useful in characterising an abstract notion, here the notion of *concept*, in more concrete terms. The study of *imagery* is thus central to the cognitivist enterprise in its attempt to define the idea of conceptual representations in the mind and of meaning in language. The claim is that images are basic abstracted concepts used to apprehend and further comprehend experiences in the physical environment. In other words, images are analytical units illustrating how cognition is partly embodied. In Palmer's terms, images are indeed

mental representations that begin as conceptual analogues of immediate, perceptual experience from the peripheral sensory organs (Palmer 1996: 47).

In other words, people perceive and conceptualise the world via images in the 'mind's eye' (ibid.: 3). However, this is where analogies fall short, in that these images in the present case are not visualisable as such. The unit is an analytical one aimed at characterising conceptual representations in some abstracted prototypical format. Indeed, most concepts are not visually perceptible, e.g. TIME, PAIN, KIN.¹ Images have thus come to be more commonly labelled *image schemas* or *schemas* (Johnson 1987, Lakoff 1987):

¹ This thesis follows the usual convention as adopted by Fillmore (1982) and Langacker (1987) to refer to non-linguistic concepts using small capital letters, and to linguistic forms in italicised small case.

Like conventional images, [image schemas] are neither context-bound, nor specific, nor conscious, nor effortful. They are unlike conventional images in two important respects: they are not rich (that is, fully detailed), and they do not have specific knowledge associated with them. They are relatively abstract schemas that organise what can be perceived and visualised, but they themselves cannot be directly visualised in the way a rich image can be (Lakoff 1987: 453).

Clausner & Croft (1999: 15) provide an inventory of such image schemas:

(1) SPACE	UP-DOWN, FRONT-BACK, LEFT-RIGHT, NEAR-FAR, CENTER-PERIPHERY, CONTACT
SCALE	PATH
CONTAINER	CONTAINMENT, IN-OUT, SURFACE, FULL-EMPTY, CONTENT
FORCE	BALANCE, COUNTERFORCE, COMPULSION, RESTRAINT, ENABLEMENT, BLOCKAGE, DIVERSION, ATTRACTION
UNITY/MULTIPLICITY	MERGING, COLLECTION, SPLITTING, ITERATION, PART-WHOLE, MASS-COUNT, LINK
IDENTITY	MATCHING, SUPERIMPOSITION
EXISTENCE	REMOVAL, BOUNDED SPACE, CYCLE, OBJECT, PROCESS

These embodied image schemas are further metaphorised for conceptualising and expressing non-embodied experience, i.e. abstract concepts (Johnson 1987, Lakoff 1987). In this sense, image schemas are generative conceptual devices used for both basic (i.e. embodied) and complex (i.e. abstract) conceptualisation enabling abstract understanding in cognitive reasoning and infinite expressibility of relations in language forms.

The imagistic analogy is useful again in characterising schematic conceptualisation as interpretive. Indeed, images are interpretations, by definition. Images are mirrored differently according to the angle, the light, the distance, and so on; that is, images are relative to the point of exposure or reference for observation, or 'vantage point' (Langacker 1991: 35). In short, conceptual representations are not the raw material, but indirect reflections of the raw material (Bickerton 1990: 21, Palmer 1996: 46-7). It follows that no two beings construe exactly the same image out of identical sensory input, and that no two languages, or even linguistic expressions, symbolise the same sensible experience in exactly the same semantic light:

Two linguistic expressions can therefore designate the same objective situation yet differ substantially in their semantic import because they structure it through different images (Langacker 1991: 35).

Given cognitive linguists' insistence on language being a fundamentally psychological phenomenon, such claims are highly suggestive of relativistic effects, whereby differences in semantic import incur differences in conceptual representations. Note again that similar points had been voiced by Sapir to reach precisely this type of conclusion, e.g.

The language habits of our community predispose certain choices of interpretation. No two languages are ever sufficiently similar to be considered as representing the same social reality (Sapir 1985: 162).

3.1.1.2. Semantics Defined

Semantics is thus defined as the study of lexicalised schemas, or concepts. In other words, imagistic conceptualisation is what cognitive linguists define as *meaning*:

Semantic structures are thus conceptualisations shaped in accordance with linguistic convention (Langacker 1991: 61).

The cognitive approach understands language as a representational semiotic system of symbols enabling the communication of mental images (Palmer 1996: 53). In short, semantic representations embody conceptual representations, and language is therefore image-based. Given the vast diversity of beings within the human species, coupled with the rich variety of surrounding environments in which the species evolves, divergence in images and interpretations of the world naturally occurs. As a result of this divergence, construals of reality, or worldviews, vary from one group of humans to another, and the sign systems used to embody these imagistic concepts, e.g. languages, differ. In short, because perception of the outer world is subjective, images and concepts are relative to this subjectivity, whereby linguistic diversity logically ensues. However, the conventionalisation of semantic representations in language stabilises the system, allowing conceptual imaging to be triggered by particular uses of semantic representations, and is, therefore, conditioned by the construal scope afforded by those semantic representations. In other words, cognitive linguistics explains simultaneously the motivations behind cross-linguistic semantic diversity and the dynamism of that diversity which affects imagistic conceptualisation:

The meaning of an expression is not given solely (if at all) by the objective properties of the situation it describes – rather it is a function of how speakers construe the situation and structure it by means of specific images. Semantic structure is therefore language-specific to a considerable degree, for the choice of images is a matter of linguistic convention (Langacker 1991: 56).

Language enables the stabilisation of images by its ability to embody, or symbolise, them in a somewhat concrete way. From there on, language becomes dynamic and assumes the role of an imagistic referential framework:

Meanings tend to become increasingly situated in the speaker's subjective belief-state/ attitude toward the situation (Traugott 1988: 410).

3.1.1.3. Grammar Defined

Lexicalisation patterns for encoding concepts in language go beyond the word level, and include grammatical realisations at the sentence level, and speech units at the discourse level. The place of morphosyntax, in general so central to linguistic theories, is, in cognitive linguistics, that of a tool serving the articulation of meaning. Cognitive linguists take grammar to be

the conventional symbolisation of semantic structure (Langacker 1991: 102).

Semantic structures being language-specific, it follows that grammar is thus posited as language-specific too. This may sound like either a rather empty truism in functionalist terms, or as a naïve inaccuracy in terms of surface-versus-deep levels of understanding in generative terms, yet the fundamental cognitive claim is simply that grammar is symbolic rather than arbitrary,² and instrumental rather than foundational, and that it contributes to the semantic generation of concepts corresponding to cognitive schemas akin to images in the mind. In other words, the entire perspective used to approach linguistic forms and devices is shifted in cognitive linguistics, so that any grammatical relation, inflection, or other grammatical morpheme, stands as a symbolic unit of meaning, that is as a conceptual representation. From there, modern relativists have simply to emphasise cross-linguistic differences to obtain firm support for their claims from the cognitive enterprise. In other words, cognitive linguistics implies linguistic relativity, and by studying language “as a psychological phenomenon” (ibid.: 100), it offers potential insights for the further revival and improvement of a modern theory of linguistic relativity.

3.1.1.4. Conceptual Representations (CRs) ≠ Semantic Representations (SRs)

Thus far, the notion of CR remains somewhat underspecified, therefore, its connection to SRs remains ambiguous. Cognitive theorists (e.g. Langacker 1987, 1991; Jackendoff 1983, 1992) appear to assume their equation, e.g. Langacker (1991) equating semantic structures and conceptualisation, Jackendoff (1992) equating concepts and *semantic* primitives. However, such appearances may be deceiving as they would render both notions tautological, just as they would imply linguistic determinism, that is to say that what we say and mean would be equal to what we think, and vice versa. In fact, Langacker’s (1976) early position on the issue explicitly denied this equation, based on the basic premise that

Semantic representations, as *linguistic objects*, are to be distinguished from conceptual structures [CRs], the *objects of cognition* (ibid.: 322, emphasis added).

The question may, therefore, not be whether CRs and SRs are identical, but whether they are isomorphic, i.e. whether they have the same internal structures, or at least the same properties (Levinson 1997, 2003). On the other hand, some of those theorists (e.g. Fodor et al. 1975, Jackendoff 1983) posit that CRs constitute a universal ‘language of thought’ innately available to members of the species. This latter position seems untenable however, when considering

² This claim is made relative to the individual cognising mind, in the sense that linguistic meanings are not perceived as arbitrary by the native speaker. At the analytical level, however, symbolism and arbitrariness are by no means exclusive, and cognitive linguists do not reject the notion of the arbitrariness of the sign.

concepts linked to ecological relevance, e.g. CAPITALISM, RUGBY, ELECTRICITY (Putnam 1988). Indeed, it is difficult to explain how human minds would be born with even basic concepts, e.g. COCONUT, without prior interaction with the empirical reality of those concepts. In order to escape determinism, Fodor et al. (1975) go so far as questioning the very existence of SRs. Such a denial is unhelpful to the present discussion (see below). On the other hand, to escape the nonsensical implications of absolute universalism, Jackendoff (e.g. 1992) suggests that CRs are universally *accessible* – rather than given – in that the cognitive processes required for developing concepts are equally available to human cognising creatures, given the right ecological triggers and pressures for conceptual maturation.

Overall, a clear understanding of semantic and conceptual representations is far from established across the cognitive science community, and it remains unclear how precisely similar and dissimilar the nature of these representations is. However, elucidating this very point is crucial in relativity studies, as their goal is to establish how one type of representation may influence the other. The point may be thus illustrated: if both types are essentially the same thing, then the question over influences is irrelevant, for both are self-determining. In other words, if semantic and conceptual representations are the same, then semantic meanings determine concepts just as much as concepts determine semantic meanings. However, this extreme equation of linguistic semantics and non-linguistic concepts amounts to linguistic determinism – not relativism, as hinted at above, and as mentioned in Chapter 1, there is no evidence for such a stand.

In fact, argumentatively speaking, the position that SRs and CRs are one and the same type of representations does not hold for a number of reasons (Levinson 1997, Sinha 1988, Langacker 1976, Vygotsky 1978, 1986). These include the obvious fact that a number of concepts are not readily codable (if at all) in various languages. Indeed, all languages suffer from lexical gaps in various semantic fields, e.g. colour, kinship, smells, and from missing grammatical features and categories, e.g. tense, number, conditional, aspect. Unlike the ‘language of thought,’ the language of symbolic forms is finite in the resources it affords, so it may, if anything, be learnable by native speakers. Therefore, only so many CRs are expressible in language. Linked to this economical property of symbolic forms, it follows that SRs are rarely as fine-grained as CRs, that is, SRs are referential in a generic, or prototypic, fashion, so that “only a part of the complete concept that we have in mind is expressed” (Boas 1966: 39). Semantic meaning is thus underspecified as a rule, and speakers are rarely able to communicate precisely what they mean. As a side-effect, they sometimes meet difficulty in making their meanings clear, therefore, begging the following question:

Why would we struggle to clothe our thoughts in words if skin and cloth were the very same layer? (Levinson 1997: 21).

This underspecified property of SRs, however, is also economical, and communicatively efficient, as it affords a highly pragmatic nature to human languages. Indeed, if speakers were able to express exactly what they meant consistently, they would undoubtedly jeopardise harmony and cooperation in symbolic exchanges. Flouting conversational maxims (Grice 1969) and face management (Brown & Levinson 1987) is precisely what causes communication to collapse, rendering exchanges lengthy, redundant, at times irrelevant, and possibly too taxing for efficient cognitive processing. Even if SRs were well-specified and conceptually idiosyncratic, it is unlikely therefore that speech acts would be fully referential as this would violate the pragmatic code regulating communicative behaviour for successful language interactions.

Also linked to the argument of economy, all languages further utilise deictic and anaphoric formulae of reference, e.g. *here, now, behind, then, you*. The semantic value of these LRs is the vaguest possible, and their conceptual analogues are only resolved in the here-and-now of the exchange. The important point here is that SRs are underspecified in general, and completely underspecified in deictic cases, whereas CRs are always highly precise and are, therefore, never underspecified. In other words, not only do people lack a HERE CR for instance, but as a rule indexical and anaphoric SRs are clearly language artefacts purposefully designed for economical reference, that is, they are not actual concepts. Crucially, this further shows that SRs and CRs are fundamentally different types of representations, using different norms of functioning, and different features of realisation:

The pervasive view that SRs are schematic, incomplete, or semantically general suggests that SR is... a representational medium with a different vocabulary and syntax (Levinson 1997: 19).

Finally, it is worth reiterating that the very learnability of languages is jeopardised by the equation of CRs and SRs. One possibility is that the human mind is born a blank slate, and acquires CRs as it learns a native language. This is scientifically untrue, and it would also beg the question of how any form of acquisition is possible without any conceptual or semantic form existing as an original springboard. An alternate would be to suggest that a given portion of CRs and SRs are innate. Though, conceptually, this makes good sense, it remains unclear how human minds may entertain any form of semantic representation prior to acquiring language. In short, it seems argumentatively difficult to reconcile opinions assimilating semantic and conceptual representations under the same heading, as either identical or isomorphic.

3.1.1.5. CRs & SRs Defined

Having thus far briefly examined issues pertaining to defining CRs and SRs, we now are in a position to attempt such defining characterisations. Langacker offers a definitional template for this exercise, as follows:

I will understand the term ‘semantic representation’ to refer to the most abstract linguistically determined structure underlying a sentence, the most abstract representation characterised to a significant degree by linguistic principles (as opposed to principles of general cognition). By ‘conceptual structure’ [CRs] I will mean the structures manipulated in cognition, whether linguistic or non-linguistic in nature (Langacker 1976: 319).

Building on Langacker’s understanding, the following working definitions represent the understanding of SRs and CRs adopted in the remainder of this thesis. Put simply, a CR is the “representation of a thought” (Levinson 1997: 15). In other words, it is the representation of an idea in the mind – whether linguistic or non-linguistic. CRs are thus mental concepts akin to images, in an analogical sense. They also vary in their degree of complexity, from basic and embodied CRs, e.g. basic image schemas, to elaborate, abstract, or disembodied CRs, e.g. complex images, culturally-construed images. Those schematic CRs deriving from cognitive abilities are, therefore, universal, whilst other CRs construed by environments, cultures, folk classifications, and other idiosyncracies are not universal, and thus fluctuate across individuals.

On the other hand, a SR is a linguistically-mediated concept. As such, it is a conventionalised linguistic representation of an idea in the mind. SRs are thus mental concepts corresponding to set linguistic conventions of meaning with precise definitional features of understanding, and are thus

understood to be objects of cognitive *and* communicative processes (Sinha 1988: 64, emphasis added).

themselves cognitive objects but certain of their properties are due solely to the requirements of linguistic expression (Langacker 1976: 327).

By virtue of being conventionalised ‘objects,’ SRs are shared representations – albeit in an idealistic sense. Their conventionalisation springs from their functional, i.e. purposeful, nature, in that SRs’ *raison d’être* is to mediate the exchange of meaningful information for successful communication across participants. As such, SRs are external representations. Yet at the same time, their ease and systematicity of processing indicates that they are internalised over lifetimes of languaging experience. So, for instance, core, basic SRs are internalised in early life, and more specific, complex, and peripheral SRs may come to be internalised later in adult life, whilst a number of SRs never come to be internalised at all by some native speakers, and no speaker ever internalises all the SRs of their native language. To summarise the above,

Because of their mediational role in communication and representation, discursive concepts [SRs] possess a cognitive or mental aspect; equally, though, they possess a material aspect inasmuch as they are embodied in signifying structures... The cognitive aspect of discursive concepts [SRs] should... be thought of as *inter*-subjective, or inter-mental; and as being underpinned by material practice (Sinha 1988: 65).³

SRs and CRs are thus essentially different in nature, and this difference is not a simple etic vs. emic one. SRs may be seen as the negotiation or mediation of images between linguistic representations (LRs) and CRs (see Figure 3.1.), that is,

SRs do not encode the corresponding thoughts, they rather – if communication is successful – invoke them (Levinson 1997: 19).

Figure 3.1. Mapping of SRs between CRs & LRs.

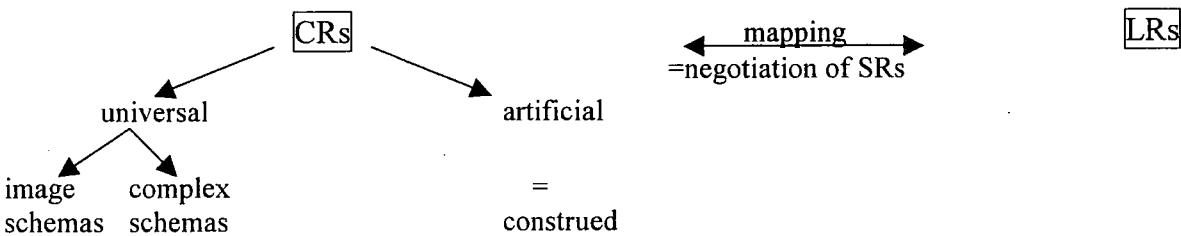


Figure 3.1. distinguishes several types of CRs. Universal CRs are also referred to as *molecular* or *atomic concepts*, and artificial CRs as *molar concepts* in the literature (e.g. Levinson 1997, 2003). It seems relevant to label the two types with respect to their universal status in a linguistic relativity perspective, as the influence of SRs is unlikely to be the same for both types of CRs. Indeed, one would expect linguistic relativity effects to be transparent in the case of construed CRs, but not in the case of universal schemas. Thus far defined, linguistic relativity interests lie with demonstrating effects on universal CRs, as related to cognitive functions.

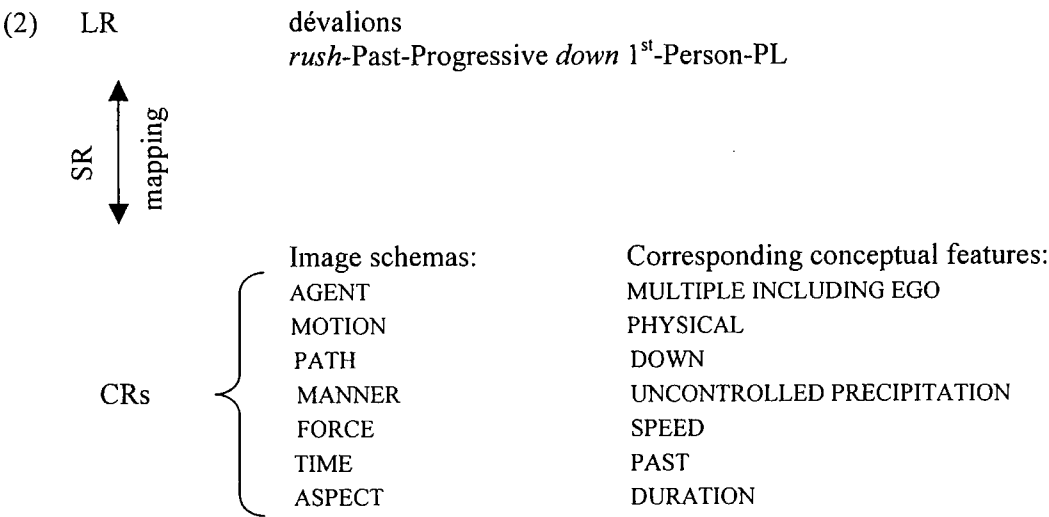
In this understanding, image schemas are thus a type of CR. Complex schemas are understood as concepts deriving from combined and/ or metaphorised image schemas, and from complex cognitive computing, such as logical, mathematical, ironic, temporal, orientational, emotional abilities and the like. The two types of universal schemas are distinguished as their cognitive reality is substantially different in terms of complexity of representation. Furthermore, this complexity entails that, though universally conceptualisable, the environment – including language conventions – is more prone to impact on complex conceptual processes (e.g. education, cardinal locational referencing).

Finally, artificial CRs are likely to encompass most CRs. They may partly include universal schemas, but they also denote concepts pertaining to world knowledge. In other words,

³ Note that *discursive concepts/ representations* (Sinha 1988) correspond to the notion of *semantic representations* adopted in this thesis. To refer to *conceptual representations*, Sinha (1988) uses the term *psychological concepts*.

artificial CRs are not universal – let alone innate. These CRs are entirely dependent on environmental triggers for their development, including ‘natural’ ones, eg. TREE, SEA, TABLE, MINOTAUR, INTERNET, RICHES, POSTERITY. These CRs may be widespread, yet humans are not born predisposed to entertain them *without* explicit exposure to them. In some cases, the type of exposure may be physical, e.g. SEA, or imaginative, e.g. GOD, or imagistic/ visual, e.g. UNICORN, or in other cases, abstract, e.g. LIBERTY. Such CRs, especially those which are disembodied and abstract, may even be first introduced via linguistic descriptions, that is, via SRs ‘invoking’ those conceptual analogues, e.g. GULLIBLE, EXAPTATION.

Returning to focus on SRs, their tremendous communicational advantage is their holistic packaging of partial CRs in external LR. In other words, SRs may conflate several CRs at once in one LR, rendering multiple conceptual processing, or chunking (Miller 1956), possible, as demonstrated in (2), e.g.



Different LR's thus trigger different SRs profiling different CRs, e.g. *dévala* profiles a different AGENT from the above, namely SINGLE ALTER-EGO, and a different ASPECT, i.e. COMPLETE; whilst *dégringolions* profiles a different MANNER and different FORCE DYNAMICS, and so on. The point for relativistic purposes is that LR's encode CRs differentially within and across languages, even at the atomic level of image schemas, e.g. DURATION may be encoded explicitly via aspectual morphology (e.g. English present progressive), or it may not (e.g. French *présent simple*). In principle, all CRs are entertainable by any human mind; however, construed CRs may be selectively so due to lack of exposure or environmental pressure for acquiring the concept, e.g. INTERNET, PSYCHOANALYSIS, X-BAR THEORY. From these points, we may draw two main entailments which are of interest to linguistic relativity, (a) even those CRs deemed universal may be differently codable across languages, hence a linguistically backgrounded SR_x

may entail low attentional levels to $CR_{\alpha, \beta, \chi}$ in the corresponding mapping operation for SR_x ; and (b) vice versa, a linguistically foregrounded SR_z may entail high cognitive salience of $CR_{\delta, \epsilon, \xi}$ which may then trigger the further conceptualisation of associated $CR_{\eta, \theta}$. Hence, SRs may interact with CRs in a mutually influential manner, so that

Discourse invokes conventional imagery and provokes the construction of new imagery. At the same time, imagery structures discourse; they are mutually constitutive (Palmer 1996: 6).

In short, SRs constitute attempts to express CRs, but they can do so only selectively due to resource specifications and limitations, that is, due to framing restrictions in linguistic semantics. Hence, it is conceivable that SRs may condition how speakers interpret and perceive CRs, that is, linguistic meaning may influence conceptualisation and cognitive functions.

3.1.2. CONSTRUING REALITY

Conceptualising the world in terms of images via language is referred to as *coding* or *mapping operations* in cognitive linguistics (e.g. Langacker 1976, Bickerton 1990: 27):

To translate a conceived situation into linguistic terms, a speaker must select pertinent aspects of his current conceptual structures and cast them in a form appropriate for linguistic operations; let us call this process ‘coding’ (Langacker 1976: 322).

This process relies on the partial referencing and categorising properties of language, i.e. Whorf’s notion of dissecting and cutting up nature in order to organise “the kaleidoscopic flux of impressions” (1956: 213), or in Bickerton’s terms, “for sorting and manipulating the plethora of information that deluges us throughout our waking life” (1990: 5). This notion of imagistic conceptualising, or operational mapping/ coding, of the world naturally leads to the core aspect in linguistic relativity of worldview, or subjective reality. This section aims to review some of the linguistic resources enabling those mapping operations between SRs and CRs, resulting in reality construals. The very notion of *construal* refers to the reality, or conceptual, construals engendered by the semantics of language structures, lexical items and speech units, in that each specific combination of linguistic units of meaning entails a particular conceptualisation of a situation. The process of construal is itself determined by several aspects, including e.g. perspective, highlighting, metaphorising, framing.

3.1.2.1. Perspective

The notion of *perspective* refers to the allocation of referential points from which the meaning of a sentence is established. Consider, e.g.

- (3) The cat is chasing the mouse.

- (4) The mouse is being chased by the cat.

The reference point, or *landmark*, would correspond to CAT in (3) and MOUSE in (4). That is, the landmark assumes the perspectival role in the semantic construal of a conceptual situation. On the other hand, the element standing in relation to that landmark is the *trajector*, e.g. MOUSE in (3) and CAT in (4). Semantic construals in language entail the adoption of contrasting perspectives, which in turn afford the assignment of conceptual roles to the elements profiled in given standing relations. Eventually, though the situations depicted in (3) and (4) are essentially identical, their respective SRs entail diverging perspective allocations, and hence the adoption of diverging CRs relative to the situational construal at hand.

3.1.2.2. Attention

Perspective further enables SRs to emphasise, or *highlight*, given portions of the situation at hand. For instance, in an active sentence such as (3) above, the perspective of CAT is granted higher conceptual emphasis than that of the trajector; and vice versa, in a passive construction such as (4), the perspective of the landmark MOUSE is highlighted over that of CAT. The notion of *highlighting* thus refers to the relative emphasis afforded by the SRs of the various elements in the situation expressed. If a semantic element receives low emphasis, it is *backgrounded*, and if it receives high emphasis, it is *foregrounded*. Consider, e.g.

- (5) a. I ate the last Easter egg.
b. The last Easter egg has been eaten.
- (6) a. I flew to Paris.
b. I went to Paris by plane.

The above sentences illustrate again examples of the same situation expressed via two differing semantic construals. In (5) as in (3) and (4), the perspective of the landmark is the one being foregrounded, whereas that of the trajector is backgrounded. In (6), however, the perspective contrasts a PATH and a MANNER of displacement through space. The linguistic encoding of the MANNER in an optional constituent in (6b) highlights the MANNER and brings it to the foreground of the semantic construal, unlike in (6a) where the MANNER is backgrounded, and the PATH instead is foregrounded (Talmy 1985: 122). In short,

When we use a particular construction or grammatical morpheme, we thereby select a particular image to structure the conceived situation for communicative purposes (Langacker 1991: 12).

This very selection is precisely what makes semantic highlighting possible, and by relating to the notions of perspective and semantic emphasis, highlighting therefore also relates to imagistic, or conceptual, *salience*, i.e. heightened cognitive awareness, so that the perspective

foregrounded in a sentence denotes the salient conceptual element(s) in the given construal. Cognitive linguists assume this semantically construed salience to reach over into cognition, so that foregrounded SRs render the mapped-onto CRs salient in cognitive, or non-linguistic, conceptualisation.⁴ The logic of the argument once again leads to linguistic relativity, and thus unsurprisingly echoing Whorf (e.g. 1956: 213), Langacker (1991: 35) concludes that

People have the capacity to construe a scene by means of alternative images, so that semantic value is not simply received from the objective situation but instead is in large measure imposed on it.

3.1.2.3. Comparison

Cognitive linguistics further places particular attention on the comparability of elements in standing relationships. As mentioned above, semantic construals may profile representations in relations of contrast, i.e. landmark vs. trajector.⁵ Semantic construals also profile representations in relations of similarity. These may be of two types, (i) concrete identity, i.e. category belonging, e.g. (7) and (ii) abstract similitude, e.g. (8).

- (7) a. A lamb is an animal.
b. A lamb is a kind of animal.

- (8) This child is a lamb.

(8) differs from (7) in that the two profiled entities are not identical by virtue of belonging to the same conceptual category, but they stand in an abstracted relation of similitude in a figurative sense. (8) uses concrete domains, i.e. CHILD and LAMB, to refer to an abstract one, e.g. SOFT AND QUIET BEHAVIOURAL QUALITY. This is an example of a *metaphor*. Metaphors have been shown to be a pervasive type of linguistic construal of CRs (Lakoff & Johnson 1980, Lakoff 1987); for instance, emotions about relationships may be expressed as sensory perceptions through our more direct experience of notions such as TEMPERATURES, e.g. a person can be *cold*, or one may *burn* for someone, or PHYSICAL DISTANCES, e.g. being *close to* someone, behaving in a *distant* manner; likewise, theoretical arguments may be talked of as CONCRETE BUILDINGS, e.g. an idea has a *basis*, its *foundations* may *crumble down*, one also needs to *back up* and *support* claims, and so on and so forth. What is important for this discussion is that human languages make use of concrete conceptual domains in linguistic construals of abstract situations. In short, one domain is used to conceptualise another. Human cognition appears to rely on these established

⁴ The idea goes further still with regards psycholinguistic processing: existing SRs, especially recurrent ones, and their corresponding CRs – stored as non-linguistic bits of knowledge – become neurally interlinked through pathways in the brain during the course of language acquisition for the greater ease of efficient linguistic and conceptual processing.

⁵ Note that the contrast has also been labelled in terms of *figure* versus *ground* (e.g. Talmy 1983, 1985, 1991, 2000).

domain construals to a substantial extent and, therefore, render conceptual and linguistic processing all the more systematic and efficient. Metaphors are thus particularly relevant to illustrate the interactivity and ensuing parallels existing between CRs and SRs, and to suggest dynamic influences between linguistic construals and cognitive conceptualisations of situations and ideas.

3.1.2.4. Frame & Domain Knowledge

The above key points all relate to the malleability of semantic structures, but do not explain how SRs are accessed. To address this issue, the following section will discuss the important notion of *frames*. Frame semantics (e.g. Fillmore 1982) seeks to account for the conceptual organisation and accessibility of SRs in cognition. A frame is a matrix-like, abstract notion referring to the knowledge of inter-linked domain properties of linguistic elements. In Fillmore's terms, a generic working definition of *frames* refers to

any system of concepts related in such a way that to understand any one of them you have to understand the whole structure within which it fits (Fillmore 1982: 11).

Applied to SRs, a semantic frame is, therefore, background knowledge of a linguistic nature, in which SRs and their mapped-onto CRs exist in connectionist knowledge matrices, and in which no representation stands in isolation. However, it should be noted that a semantic frame is not a semantic representation, that is to say that a semantic frame is not the meaning of a single word; yet a frame is part of that word's meaning, by virtue of representing the linguistic knowledge properties of the conceptual domain to which it belongs. A frame, in this sense, is therefore akin to a domain of reference. Note, however, that domains typically refer to non-linguistic knowledge, e.g. TIME, SPACE, EMOTIONS, VISION, MOTION, COLOUR, BOTANY, ANIMALS. A frame, on the other hand, is the *linguistic* background knowledge of a domain. For instance, a single word such as *mother* may profile one element of a genetic semantic frame to do with the domain of FAMILY; yet it may equally profile an element of a social semantic frame to do with the socio-cultural construction of MOTHERHOOD and all its denotations. In short, a frame is a vast and complex conceptual knowledge-base, which gets activated by the production of linguistic elements. Semantic frames are crucial in enabling speakers to situate linguistic representations in wider knowledge contexts for semantic understanding, and the process is possible because speakers hold internalised knowledge representations of the LRs' frames of origin. Thus, if an utterance does not provide this background knowledge explicitly (which it often does not in order to respect Gricean maxims of cooperative communication, e.g. quantity maxim), semantic understanding remains possible nonetheless because the utterance gets contextualised

cognitively through framing. Framing thus contributes to the efficacy of compact linguistic referentiality. Pre-supposing, inferencing, entailing, and other pragmatic processes in linguistic reference are possible because each language item profiles a set of frames contextualising seemingly isolated meanings.

Obviously, each individual's frames differ slightly from others' because of different life paths, experiences, and even linguistic practices, which explains communicative differences existing across e.g. regional, gender, social, or age groups. Yet communication remains successful, by and large, because there is substantial overlap between framing understandings at the language community level – despite ad hoc fluctuations at the individual level – due to the macro-scale conventionalisation of LR and SRs, and to the underspecification of semantic structures. Fundamentally too, this last point suggests that even within a language, semantic frames and conceptual construals are relative to the individual cogniser. Again, tenets from cognitive linguistics prove highly pertinent to the relativistic ideas of the uniqueness of representations and of the ensuing subjectivity of language-based and conceptual realities in that

The knowledge represented in the frame is itself a conceptualisation of experience that often does not match the reality (Croft & Cruse 2004: 28).

Equally inspired as Sinha (1988: 206), the very issue at the centre of the present argumentative knot resides in

whether indeed there can be a true representation of anything, or whether any and all representations, because they *are* representations, are embedded first in the language and then in the culture, institutions and political ambience of the representer. If the latter alternative is the correct one... then we must be prepared to accept the fact that a representation is *eo ipso* implicated, intertwined, embedded, interwoven with a great many other things beside the "truth", which is itself a representation. What this must lead us to methodologically is to view representations (or mis-representations – the distinction is at best a matter of degree) as inhabiting a common field of play defined for them, not by some inherent subject matter alone, but by some common history, tradition, universe of discourse (Said 1985: 272-3).

3.1.2.5. Summary

The above points illustrate how linguistic construal devices and processes may be analysed as corresponding to cognitive functions (see Table 3.1.).

Table 3.1. Correspondance between cognitive functions & processes, & SR construals (see also Croft & Cruse 2004: 46).

Cognitive function	Example of cognitive process	Example of SR construal
Attention	Selection	Highlighting (i.e. SR backgrounding and foregrounding)
Comparison	Similarity judgement	Trajector-landmark contrasts; metaphors; semantic category knowledge framing
Perspective	Spatio-temporal situating	Deictic reference; landmark vantage point
Image schemas (or Gestalts)	Conceptual schematisation	Semantic structuring of experience to be communicated in terms of e.g. conceptual domain unity, lexical and imaging choice, etc.

To summarise, cognitive linguistics places emphasis on the study of meaning, and conceptualises meaning as resulting from the semantic mapping of language structures and referents onto conceptual correspondents. These mapping operations afford ‘construals’ centrally dependent on perspectives, element highlighting, metaphors, and framing knowledge. When faced with one such construal, speakers and hearers do not sense a mathematical equation of symbolic referents loaded with different values in need of computing to add up to some meaning; instead they sense the staging of a rich visual scene with spotlights on particular areas and dim lights on others that the eye is, nonetheless, still capable of discerning. As natural born speakers, humans are capable of making instant sense out of the visualised scene because it relates to their existing knowledge-base which has itself developed out of their embodied experiences in the world. Hence, meaning is arrived at by the mind’s eye effortlessly, and it naturally makes sense, just as the eye naturally sees.

3.1.3. RELEVANCE TO LINGUISTIC RELATIVITY

All the above considerations concerning the nature of language and cognition as espoused by cognitive linguistics display the relevance of the discipline in investigations of linguistic relativity. In fact, as mentioned by Croft & Cruse (2004: 72),

It appears that the pervasive role of conceptualisation in linguistic expression entails a relativistic approach to the relation between language and thought.

This underlying relativism is evident enough to constitute a systematic point of discussion in cognitive linguists' writings (e.g. Langacker 1976; Lakoff 1987: chapter 18). Langacker's position on linguistic relativity, however, remains somewhat ambivalent. Uncontroversially, he rejects deterministic interpretations of Whorfian tenets, stating that

We are not prisoners of the conventional images of our language (Langacker 1976: 345).

On the other hand, Langacker appears to assume without further consideration that language must and does influence conceptualisation:

...language influences, facilitates, or is an instrument of thought. This is obviously true and seemingly uncontroversial (ibid.: 308).

Overall though, his arguments on the nature of SRs, images and conceptual structure lead to linguistic relativity. Consider:

Identical or very similar semantic representations will have different cognitive import for speakers of two languages, or even two speakers of the same language (ibid.: 337).

The lexical or periphrastic means that a language provides for the expression of a given notion therefore influence the precise image cast by the semantic representation (ibid.: 340).

Whatever these images are, they must be cognitive in nature, so if two sentences convey different images, they must represent different conceptual substructures (ibid.: 343).

As mentioned above, Langacker's position appears ambivalent on the whole, yet this may be justified by the fact that he addresses linguistic relativity largely in deterministic terms:

The LRH [linguistic relativity hypothesis], as I will understand it, pertains to the effect that language-specific differences have on thought, i.e. the degree to which our thoughts are *controlled, determined, constrained, or directed* by virtue of the fact that we speak one language rather than another (ibid.: 313, emphasis added).

It remains, nonetheless, that the remainder of his arguments would support linguistic relativity insofar as we understand the concept in influential rather than deterministic terms:

The linguistic system imposes an organisation of the conceptual level, in that the lexical and grammatical devices of a language facilitate the expression of certain concepts and determine the form in which conceptual substructures must be cast to be eligible for linguistic manifestation (ibid.: 324).

In other words, Langacker appears to support the idea that CRs are relative to SRs, as expressed in 'lexical and grammatical devices.' This Sapirian understanding of the relativity of concepts is equally present in the more recent discussions entertained by Lakoff (e.g. 1987). Lakoff echoes Langacker's understanding that the human conceptualising *capacity* is hypothetically the same for all individuals, but that the understanding afforded by this capacity is dependent on experience, including symbolic practice. This experientialist stand – reminiscent of 18th-century Romantics – entails that experientially embodied conceptual systems vary across individuals,

despite the constancy of conceptualising potential across the species. Language, being a substantial part of human experience, thus constitutes a factor contributing to the shaping of conceptualisation. Given that cognition is experientially embodied, Lakoff further predicts that conceptual variation is most likely to occur with SRs expressing non-bodily experiences, that is, abstract understandings not grounded in universal experiences such as kinaesthetic and basic-level image schemas. Overall, Lakoff's position is thus more overtly faithful to and supportive of Whorfian relativism:

Concepts that have been made part of the grammar of a language are used *in* thought, not just *as objects of* thought... the way we use concepts affects the way we understand experience... conceptual systems are different if they lead consistently to different understandings of experience. Therefore, conceptual systems whose concepts are used differently are, to me, different systems (Lakoff 1987: 335).

3.1.3.1. Shared Cognitive & Semantic Understanding

Overall, cognitive linguistics is highly conducive to a modern revival of Whorfian interests. The above sections have attempted to illustrate how the two approaches to language, espoused by cognitive linguists and by relativists, often intersect and overlap on fundamental notions of understanding and poles of interest. We have seen, for instance, how cognitive linguists echo Whorf's understanding of "linguistics [as] essentially the quest of meaning" (Whorf 1956: 73), in their conception of language as semantics. Equally, cognitive linguists endorse a psychological definition of language, assimilating semantic construals and cognitive operations together, so that the latter enable the former, and the former reflect the latter. This position fundamentally entails tight interconnectedness between, and dependence of, language on cognitive functions. In short, cognitive linguists adopt the same basis of understanding of language as Sapir and Whorf did decades previously, and although cognitive linguistics is not systematically comparative and its axis of research is not directed at proving relativity, it nonetheless offers critical insights for the revival and scientific improvement of a modern theory of linguistic relativity. In addition, it has indeed generated a great number of relativistic studies in recent years.

As detailed in Chapter 2, Whorf's famous claims were the culmination point of discussions and linguistic observations spanning centuries, and originally finding firm inspiration in Immanuel Kant's rationalistic philosophy (1792, 1796), which claimed that the human mind naturally categorises the pre-given, yet chaotic environment in which it lives, in order to impose order upon it and eventually identify its ontological purpose. Kant suggested that the mind completes this task by construing categorical systems of concepts such as culture, theory, and language. In other words, languages, via the conceptual categories they devise, make

sense of the world; that is, they turn the raw environment into a conceptual reality. Through their differences, languages therefore illustrate differing realities, or worldviews. Crucially for the present discussion, this understanding is also explicit in the more modern cognitivist enterprise:

The world is not some kind of objective reality existing in and for itself but is always shaped by our categorising activity, i.e. by our human perception, knowledge, attitude, in short, by our human experience (Dirven & Verspoor 1998: 14).

As such, cognitive linguistics may be seen as a modern revival of Boasian anthropolinguistics (Palmer 1996: 27), in that it shares similar interests in concepts, mental representations and categories, imagery, and meaning (Langacker 1991: 2).

3.1.3.2. Cultural Linguistics

As Langacker (*ibid.*: 264) defines it, cognitive grammar is “a ‘usage based’ model of language structure”, acknowledging the importance of context and of the social nature of language. This Sapirian element has been shown to be pervasive in Langacker’s definitional outline of modern cognitive linguistics. Still, by defining language “as a psychological phenomenon” (*ibid.*: 100), cognitive grammar may be perceived as oblivious to the cultural component of the triadic relativistic relationship between language, thought and worldview/ culture. In short, the central anthropological component present in Boasian relativity appears to be somewhat lacking (however, see Langacker 1994 for a discussion of culture). Overall, the understanding adopted in cognitive grammar is that culture and language are interlinked, and that both pertain to cognition:

language and culture overlap extensively, and both are facets of cognition (Langacker 1994: 26).

In addition to this consideration, language is analysed as dynamically situated in its socio-cultural context, which it has helped fathom, and which, in turn, enables its transmission:

Language is culturally transmitted and a primary vehicle for cultural interaction and transmission (*ibid.*: 52).

The relationship is thus perceived as dynamic, though rarely expanded on. It is exactly this cultural component, however, that Palmer (1996) tries to incorporate in his cognitive theory of language. Palmer (*ibid.*) proposes a synthesis of anthropolinguistics and cognitive linguistics, which he labels *cultural linguistics* (*ibid.*: 35-6). He merges in anthropolinguistics the various directions adopted by Boasian linguistics, ethnosemantics,⁶ and the ethnography of speaking. In

⁶ In vogue in the 1960s, ethnosemantics (or ethnoscience) is the study of meaning culturally contextualised. A subfield of cognitive anthropology, ethnosemantics gradually declined in the late 1970s in favour of Hymes’ model of the ethnography of speaking and of the applied field of sociolinguistics (cf. e.g. Tyler 1969, Casson 1981).

short, Palmer adds an anthropological dimension to cognitive linguistics. By doing so, he sets the study of worldview at the centre of his theory:

Knowledge of worldviews is necessary for the more fine grained activities of grammatical analysis and precise translation. Worldviews provide the most entrenched and enduring semantic imagery that underlies both grammatical constructions and figurative expressions (ibid.: 116).

His theory reiterates the essential importance of imagery, linguistic symbolism, conceptual and linguistic categorisation, and the social nature of language (ibid.: 290-2). Palmer is also explicitly relativist in his theoretical position (ibid.: 293), though empirically, he addresses the topic only marginally. Instead, Palmer – reminiscently of Boas and Hymes – emphasises culture over language, and essentially examines language as an overt instrument for the understanding of culture, which, in faithful cognitive style, he defines as follows:

culture – including language – is a society’s entire stock of traditional knowledge, an ever-accumulating social edifice of partially shared imagery” (ibid.: 116).

This approach to culture as shared cognitive representations, or images, is in cohesive agreement with the emphasis he lays on worldview, and with the cognitive modelling he offers for its definition:

Mental models govern the use of language and mental models are cultural models; worldviews consist entirely of mental models. Thus, their study provides the main access to an understanding of the interrelation of language and culture (ibid.: 56)

In other words, in Palmer’s approach, culture is the guiding channel of human cognition and the pencil drawing the images which languages symbolise. Further, the above working definitions afford the classification of most aspects entering the human world as being cultural, from language to worldview, and even to colour categories (ibid.: 82-88),⁷ and emotions (ibid.: 107-9); for, as he sees it,

The dance of culture and biology is delicate, and there appears to be no scientific justification for making sharp analytical distinctions among emotions, cognitions, and discourse (ibid.: 109).

In short, Palmer appears to essentialise culture to the point that it becomes difficult to grasp its relevance as an analytical artefact. Indeed, it seems that Palmer implies that all human activity, behaviour, and cognition is culturally determined. This position therefore advocates cultural relativism – or even determinism – but not linguistic relativity.

⁷ His argument for judging colour terms as culturally determined is that: “To say that culture plays no role at all in determining common experiences and defining basic colour terms would be to indulge in the fallacy of exclusion” (Palmer 1996: 85).

Overall, Palmer sets out to refine Hymes' model of the ethnography of speaking and to reground it within a cognitive framework (*ibid.*: 35-6). His axis of research targets language use in society and culture, and aims at a sociolinguistic result. More importantly, his cultural linguistics enterprise exemplifies the pertinence of cognitive linguistics as an overall understanding of language phenomena to relativistic ideas espoused by Sapir, Boas, Whorf, Hymes, and others.

3.1.4. SUMMARY

Overall, the cognitive approach does not constitute a re-formulation of linguistic relativity *per se*, in that it does not directly target relativist ends. Rather, its perspective on the study of language entails looking at linguistic diversity and linguistic construals of reality and, thus, potentially at linguistically-mediated worldviews. In so doing it provides a new template for relativist studies. Cognitive grammar, as such, is indicative of the relevance of the issues examined in Chapters 1 and 2.

Specifically, it has been demonstrated that cognitive linguistics entails an interactive understanding of language in the mind. This interactivity exists at the cognitive level between general cognitive processes and linguistic processes, meaning that language is not an independent cognitive faculty, but that it emerges from general cognition and is, as such, a psychological phenomenon simultaneously expanded and limited by human cognitive abilities. This interactive connectedness makes it possible, in turn, for language to affect non-linguistic cognitive abilities. This understanding further posits an unbounded continuum between linguistic levels, meaning that aspects of language are not autonomous from one another, but dynamically motivate and constrain each other in a holistic fashion. This unified view of the language machinery affords a cohesive understanding of its ethos as it pertains to its function, namely the expression and understanding of meaningful information. The psychological modelling of semantics has been defined in *imagistic*, that is conceptual, terms. Language, thus, is a cognitive tool crystallising concepts via the media in use, e.g. speech, signs, writing. This 'crystallisation' entails mapping, or coding, concepts onto the SRs afforded by the LRs existing in the native language. Mapping operations have properties both linguistic and cognitive in nature. They are constrained by the linguistic and communicational conventions in place in the local input. At the same time, they have also been shown to arise from general cognitive abilities, e.g. attention, salience, judgement. The mapping of CRs onto SRs yields construals of events, ideas, opinions, etc. pertaining to reality. Mapping operations, however, have been shown to be highly selective in the means they employ, that is, their reality construals are partial

only for communicative economy and efficiency. Therefore, the construals afforded generate subjective realities that do not correspond to the ‘true’ originals. This understanding means that mappings are re-encodings of reality, susceptible to further interpretive re-encoding in communicational understanding. In other words, the hermeneutics of CRs are relative to the semantic value of LRs. Given that a CR may be expressed by a variable range of LRs within a language – and thus evidently across languages too – both intra- and interlingual relativity of conceptual calibration should be expected across speakers. Interestingly too, language has been shown to be patterned beyond the sentence level at the discursive level of expression. In other words, languages show preferences in their arrangement of SRs. Hence, though CRs may be expressed by a number of LRs, certain choices prevail over others and engender fairly reliable fashions of speaking, and thus, fashions of meaning. These fashions of meaning correspond to fashions of mapping CRs onto SRs, that is, fashions of construing reality – at alpha-scale. This understanding is made transparent in cultural linguistics (Palmer 1996), and entails a relevantly relativistic focus on the Humboldtian notion of worldview, or *Weltanschauung*.

Overall, the above sections have shown linguistic relativists and cognitive linguists to share an understanding of the nature of language, meaning, cognition, and worldview, which is more than coincidental. Though cognitive linguistics aims at defining an understanding of language in general, its ideas are closely rooted in Boasian linguistics and are highly inspirational for modern pursuits of Whorfian interests in contemporary cognitive science. The remainder of Chapter 3 will illustrate how the growth of cognitive linguistics arguments has enabled the parallel development of neo-Whorfian inquiries via its emphasis on the relation between semantic and conceptual representations, whilst contextualising those inquiries in culturally-informed frameworks.

3.2. NEO-WHORFIANISM

As section 2.3. has demonstrated, the research undertaken in the 1940s up until the 1960s did not contribute to promoting linguistic relativity as a valid ‘principle’ and, hence, it is not viewed as a fruitful field of inquiry in post-war science. Yet, interest in the ontological relation between language, thought, and reality never entirely disappeared, and the research area was actively revived from around 1980 onwards. A combination of factors contributed to this revival. As highlighted above, the foundations of cognitive linguistics were, by that time, firmly grounded in modern academia. Secondly, generative linguistics and nativist psychology – thus far in vogue since the fifties – were no longer novel and were starting to be critically appreciated with regard to, amongst other things, their almost exclusive emphasis on human universals (c.f.

Langacker 1991: 262). From the mid-70s onwards, cross-linguistic data were increasingly gathered to document universalist and other theories of language (especially in the area of language acquisition). These factors conspired to generate a renewed interest in linguistic diversity and its applications. In addition, a growing feeling for the limitations of departmentalised research efforts at that time urged greater communication across disciplinary branches. Though these various intellectual currents did not entail the complete undermining of universalist theories of language, they did nonetheless create a favourable climate for the respectable return of empirical investigations and fieldwork involving the study of linguistic diversity. These research endeavours furthered interest in cross-linguistic differences rather than linguistic universals; and on the basis of newly acquired knowledge in linguistics and psychology in general, diversity could then be studied with improved scientific accuracy, thus making novel empirical possibilities and challenging theories highly attractive and sought after.

A notable point in the changing linguistic trends of the past twenty years – and one highly relevant to the Whorfian enterprise – was the increasing criticism targeted at generative linguists for their lack of attention to the study of meaning, actual language use, and context. The 1980s subsequently witnessed a new growth in studies on semantics, pragmatics, discourse, semiotics, and hermeneutics. In short, the study of language in use, together with the ‘quest of meaning,’ were back on the agenda of linguistic research.

These changes were paralleled in the social sciences by a new focus on the importance of the environment for human individual development. Studying the individual and the specific became especially fashionable as a social echo of the acme of capitalism, while a spirit of international openness and curiosity was now also commonplace – following two world wars, the cold war, and the rapid expansion of the media. In short, a new environmentalist concern rose, somewhat reminiscent of Herder’s, in which it was ‘politically correct,’ and maybe even considered necessary, to study and help preserve as rich and diverse a world as possible. In other words, the socio-economico-political climate made it fashionable for linguists and anthropologists to collect data from exotic languages and cultures, to make comparisons with systems of Indo-European origins and highlight the uniqueness (or *individuality*, or *personality*) of each language and culture, and hence of each community. This emphasis on the uniqueness of single symbolic systems and their values was obviously highly conducive to the revival of relativistic interests.

Finally, substantial bodies of relativistic research have been published over the past two decades, thereby helping to secure the return of the question of linguistic relativity in scientific circles, e.g. Alford (1980, 1981), Bloom (1981), Friedrich (1974, 1980, 1986), Hill (1988), Hill

& Mannheim (1992), Lakoff (1986, 1987), Lee (1993, 1997), Lee (1994, 1996, 2000), Levinson (1996, 1997, 2003), Lucy (1985, 1992a & b, 1996, 1997b), Palmer (1996), Silverstein (1974, 1976a & b, 1979, 1981a & b, 1985, 1987), Slobin (1996a & b, 2000, 2003a), Steiner (1992) – to cite but a few. The considerable amount of cross-disciplinary work resulting from these researchers' efforts has not only promoted linguistic relativity, but perhaps most importantly, it has helped clarify Whorf's claims and the relativity postulate in general. To a substantial extent, it has also demystified the false assumptions that came to surround Whorf's theory as a result of the negative reputation that emerged from the post-war scholarly focus on universals in linguistics, psychology, and anthropology. From these cross-disciplinary and scientific efforts, a number of mainly methodological lessons have emerged for the fruitful investigation of the language-thought-reality debate. The remainder of this section is devoted to reviewing and summarising the essential points offered by these lessons. The first sub-section identifies a series of critical steps in methodological applications of relativity; whilst the second sub-section discusses empirical enterprises as wholes, offering an initial three possibilities for departure points of study, procedures, hypotheses, and finally suggesting that the combination of two of these epistemological possibilities may ensure the optimal empirical journey through relativistic studies.

3.2.1. METHODOLOGICAL CONCERNS

Empirical research on linguistic relativity asks whether speakers of various languages differ cognitively speaking, and investigates whether and how this may be observable in overt or covert behaviour. The working hypothesis, therefore, seeks to validate the claim that different semantic representations of the same reality incur diverging conceptual representations of that reality. The methodological question for the investigator becomes one of obtaining different cognitive or behavioural patterns and, more fundamentally, the question comes down to how to test cognition:

One has to invent methods for exploring the structure and content of *non-linguistic representations* of the domain. This requires some ingenuity, because the techniques have to be developed. And this step is by no means easy to execute, because one needs to run artificial or natural experiments across cultures of quite different kinds from our own, while maintaining comparability in the essentials. The difficulties – methodological, ethical, cultural and political – are substantial, which is one reason why such little work of this kind has been done (Levinson 2003: 20).

Linguistic relativity is notoriously difficult to test empirically as it requires obtaining differing cognitive reactions to the same stimuli from speakers of different languages, whilst isolating language as *the* variable responsible for the divergences obtained in cognitive results.

Examining differing linguistic patterns and semantic relations alone fails to provide evidence for diverging conceptualisations across speakers. Such an approach is irrevocably circular. To avoid this pitfall, empirical epistemologies necessitate careful linguistic analyses independent of cognitive assessment, multiple testing methods to ensure validity of findings and the extent of pattern reliability and cognitive effects, and, finally, the control for extra variables likely to condition cognition, e.g. literacy, education, age, dialects, discrete cultural artefacts. To summarise, research must use methodologies from both linguistics and psychology, therefore requiring the crossing of disciplinary boundaries.

3.2.1.1. Lucy's Methodological Guidelines

Based on a critical review of research undertaken during the past century, Lucy (1992a) offers a few foundational guidelines for empirical explorations into linguistic relativity. According to Lucy (e.g. 1992a & 1996), most research done on linguistic relativity has been flawed in some way or other, hence methodological concerns must be carefully attended to in future research. At the same time, Lucy emphasises the lack of studies and the ensuing need for further investigations to be carried out. In his endeavour to boost empirical efforts, he details a reformed methodology which he bases on the flaws and merits of past research (Lucy 1992a: 263-75):

- (1) Comparative data must be obtained from at least two language communities, as the sole contemplation of one language and its speakers' cognitive behaviour cannot succeed to show how their linguistic and cognitive behaviour differs from that of different speakers.
- (2) These data must be linguistic, cultural, and non-linguistic (i.e. cognitive and/ or behavioural), therefore reflecting the symbolic triangular relationship between language, reality and cognition (see section 3.2.2.).
- (3) In order for these data to be compared productively, the notions of language, thought, and reality must be posited as *analytically* independent (ibid.: 264). This should afford each variable to be documented, tested and analysed without being skewed by the analysis of the other variables.
- (4) Researchers, therefore, ought to be versatile in their academic interests and competences; they must simultaneously be linguists, anthropologists, and psychologists. Lucy points here to the necessity of a multidisciplinary approach to linguistic relativity (ibid.: 265), which is necessitated by the interconnected nature of linguistic, cognitive and cultural behaviour, as posited by the linguistic relativity hypothesis.
- (5) Furthermore, investigators should endeavour to avoid any linguistic or cultural bias by leaving their own worldview and meaning systems aside (ibid.: 264). Indeed, analysing the semantic and conceptual representations of a non-native linguistic group through one's own representations leads to ethnocentric and linguacentric tendencies invalidating the scientific adequacy of the analyses. To remedy these tendencies, Lucy (ibid.: 266) suggests developing a neutral descriptive metalanguage to free the domain of focus from its semantic boundaries as construed by the respective languages.
- (6) Studies should focus on the analysis of meaning as expressed by grammatical categories, syntactic relations, and morphological realisations, for it is in their morphosyntax that languages differ the most (ibid.: 265-6). This argument remains faithful to Whorf's enterprise, whilst

discouraging the study of narrow lexical fields defined by a limited number of items (e.g. colour, anatomy), which may be non-pervasive in daily language use, and hence of limited scope for reality construals.

- (7) Lucy (ibid.: 267) further suggests that concentrating on linguistic structure rather than on cultural aspects of language (e.g. cultural uses, idioms, etc.) should be more productive, as those idiosyncratic aspects fluctuate intralingually across sub-cultural groups and over time, whereas morphosyntax remains comparatively more stable, and hence more reliable as an index of ensuing effects on cognitive patterns at the individual and collective levels.
- (8) Lucy (ibid.: 268-9) also suggests that individual behaviour should be the first thing to attend to, rather than collective, and possibly cultural, behaviour, as the (non-linguistic) culture variable is distinct from language, and may, therefore, skew the investigation, resulting in cultural, rather than linguistic, relativity.
- (9) Finally, Lucy (ibid.: 269-72) advocates rigorous control of cognitive assessments and linguistic analyses, involving careful selection of subject pools, use of control groups, design of non-linguistic stimuli, elicitation of both linguistic and non-linguistic data, and overall comparability of procedures, subjects, and results.

Throughout his review, Lucy (1992a) eagerly highlights when scholars diverge from Whorf's enterprise. However, Lucy himself superficially deals with particular aspects of central importance to Whorf, such as worldview, i.e. that central 'thought world' or 'microcosm that each man carries about within himself' (Whorf 1956: 147). Lucy sets out to study the social and cultural nature of language, but in fact, he mainly addresses the issue of language and thought, and discussed worldview somewhat briefly:

Whether or not patterns of habitual thought can or should be summed up into an overall notion of worldview is a difficult problem which will be addressed only briefly in this study (1992a: 7).

In a later review, he seems to re-emphasise the centrality of the cultural nature of language, but the argument seems mainly theoretical:

Because they [languages] rely on cultural convention for their effectiveness, languages are essentially social rather than personal, objective rather than subjective. This allows language to be a medium for the socialisation or objectification of individual activities – including thought (1996: 40).

Arguably, neo-Whorfian efforts *hypothesise*, rather than assume, linguistic relativity, which entails that their initial enterprise consists in validating the possibility of language effects on cognitive functions at the individual level, prior to extrapolating further hypotheses concerning the extent of those effects on collective, or group, thought, as reflected in group behaviour and cultural patterns. It should be possible, nonetheless, to address more collective thought patterns, even in those early stages of inquiry. Indeed, one may choose to opt for a more ethnographic approach to linguistic relativity, whereby the hypothesis seeks to correlate language patterns with observable cultural patterns, rather than with individual cognitive patterns (Lucy 1997b). Such an approach (e.g. Bloom 1981) would require an epistemology focusing on overt collective

behaviour, using ethnographic methods, as apposed to focusing on conceptualisation, using experimental psychology methods (see section 3.2.2.).⁸

Another point worthy of mention is Lucy's explicit exclusion of the study of phonology, of semantic fields of restricted scope (e.g. kinship), of special and social uses of language (e.g. metaphors, idioms), and of specialised and potential thought (1992a: 7 & 267). Instead, Lucy insists on a central focus on the syntactic and lexical organisation of meaning:

We can call this the hypothesis of linguistic relativity, as long as we understand that by the term linguistic we mean the formal structure of semantic and pragmatic categories available for reference and predication (1996: 41).

However, non-structural areas have barely been explored so far, and as Lucy (1992a: 7) notes, "language effects are [no] less likely in these areas." In other words, although these aspects of language and cognition may be more *ad hoc* by virtue of being restricted in semantic and conceptual scope, or being more culturally-loaded and, therefore, idiosyncratic and less comparable, they certainly are aspects for potentially fruitful investigation. Such investigations would broaden the extent of the validity of relativity to further realms of linguistic symbolisation and cognitive functioning, e.g. prosody and stress in phonology, metaphors, idioms and linguistic imagistic construals, as well as intellectual and abstract thinking. Such breadth would be most welcome to ground the potential validity of linguistic relativity as a comprehensive theoretical principle, rather than as a hypothesis.

Perhaps a more surprising argument in Lucy's re-formulation resides in the alleged independence of language, thought, and reality (1992a: 264).⁹ Indeed, if language influences worldview, or reality as perceived by speakers/observers, then reality is connected to and dependent on language and cognition. Relativity seems to imply an unavoidable inter-connectivity between the three variables, whereby language, thought, and reality may be relative to one another *because* they are interconnected and interdependent. However, Lucy's argument is an analytical one. Methodologically speaking, Lucy's choice for dissociating language from thought and reality is based on analytical errors in past research, which too willingly assumed the transparency of the relationships between the variables, and isomorphism between semantic and conceptual representations. By delineating the entities of thought, language, and worldview, or reality, Lucy presupposes clear-cut relationships between these entities and, thus, avoids potential fuzziness in methodologies and argumentations. The basis of the argument lies

⁸ Note that Lucy neither dismisses nor overlooks this possibility. Instead, his aim is to suggest methodological guidelines which he believes offer the most likely success of obtaining valid data on the hypothesis. His suggestions have duly been acclaimed for their valuable contribution to an improved understanding of relativistic methodology.

⁹ See Lee (1996: 77-8) for criticisms along these lines, with an added emphasis on the divergences between Lucy's re-formulation and Whorf's original paradigm.

essentially in the transparency afforded by analytical distinctions to reach unambiguous empirical results. The argument is, therefore, rational and methodologically rigorous. Lucy acknowledges the methodological nature of this point, stressing that the alleged independence between the variables is *analytical* (1992a: 264).

Overall, Lucy's methodological presentation is driven by the wish to avoid empirical and analytical pitfalls and, therefore, allow future research to offer scientifically valid contributions for the further progress of the linguistic relativity hypothesis. As such, the guidelines constitute a sound and comprehensive agenda of empirical considerations, and place Lucy's work among the most valuable since Whorf.

The following sections will examine in greater depth central methodological logistics in linguistic relativity studies.

3.2.1.2. Circularity

It is important to emphasise that one cannot simply deduce cognitive differences on the basis of cross-linguistic differences alone. Such an approach is argumentatively circular. In Hymes's words (1961: 36), circularity obtains when using

linguistic differences as the only evidence of psychological differences which language is said to determine or reflect.

Circularity is potentially the most significant pitfall to be avoided in relativistic studies. In order to show that language differences generate cognitive differences, researchers need to obtain purely cognitive data, i.e. non-linguistic thought patterns. In this type of research, the variables at work are language and cognition, with language as the independent variable and cognition as the dependent variable. Since the underlying assumption is that the dependent variable is influenced by the independent variable, it is imperative to control for the independent variable, i.e. language, whilst observing potential variation in the dependent variable, i.e. cognition. Therefore, measuring cognitive variation by studying language only constitutes circularity, and thus prevents the provision of valid data and scientific conclusions.

3.2.1.3. Comparability

Besides obtaining cognitive-only data, a comparative approach to data collection is also desirable. Cognitive patterns may be seen to be relative only through contrast with others. In other words, research must obtain linguistic data from at least two language groups. Only then may cognitive data from these two groups be collected and assessed in terms of similarity and difference:

No genuine progress [on the linguistic relativity problem] can be made unless and until the differences among languages are given an adequate comparative characterisation in

specifically linguistic terms and these differences are then related to cognitive or cultural differences which are also given adequate comparative characterisation (Lucy 1992a: 85).

Therefore, one of the first methodological concerns in studying linguistic relativity is that empirical studies must be comparative. For the sake of methodological rigour and validity, the idea in relativistic experimenting is to present the same reality to speakers of different languages, and then to observe speakers' responses to experimental tasks, or speakers' natural behaviour in that reality environment. By implementing empirical studies using several language groups, the analyst may then proceed to compare and contrast the observations made. Without the comparability dimension, the investigator cannot establish whether cognitive responses are by any means susceptible to external influence of any type. In the case where responses across groups differ and response patterns correlate with language patterns for meaning-making, the investigator may posit potential effects of language on cognition. In the case where responses do not differ across groups and do not appear to correlate with language patterns, the investigator may posit potential universals of domain conceptualisation.

3.2.1.4. Culture Variable

A potential difficulty in identifying language patterns as *the* variable responsible for cognitive variation is the pervasive variable of culture. Task responses often diverge across language groups for the simple reason that these groups belong to separate cultures with distinct social practices and folk beliefs. The issue may thus become one of sorting the cultural from the linguistic. For this reason, it is important to monitor for a number of contextual variables when investigating linguistic relativity, from general folk beliefs to educational levels, overall lifestyles, gender, age, socio-economic status, and the like. This task is potentially overwhelming. However, to avoid this problematic aspect, investigators may select aspects of reality, language and thinking with as few cultural influences as possible (see section 3.2.2.2. below). For instance, reality domains such as kinship, linguistic aspects such as lexis and metaphors, and beliefs such as religious faith are heavily loaded with culture-specific information more likely to yield cultural rather than linguistic relativity. Hence, Whorf's and Lucy's insistence on focusing on morphosyntactic aspects and natural domains (e.g. space, time) is doubly relevant, as allegedly it is in their morphosyntax that languages differ the most from one another, and this linguistic level is relatively culture-free – as are natural, rather than human-constructed, domains of experience.

3.2.1.5. Language Groups

The issue of cultural aspects blurring the transparency of language-only effects is crucially also present in the choice of speaker communities. In this case, the problem becomes one of

validating the comparability of the subject samples whose behaviour is under study. One partial remedy may be to select groups similar in their respective profiles in terms of e.g. age, gender, education, environment and the like. For instance, young Western subjects studying psychology at university are unlikely to be comparable to older, uneducated farmers or factory workers in the Third World.

3.2.1.6. Validity

On a comparable note, it may bring more validity to the relativity enterprise to obtain conclusive results across speakers of closely-related languages (and hence possibly closely-related cultures), than to examine differences across speakers of widely-divergent, unrelated languages and cultures, e.g. Whorf's study contrasting Hopi vs. English (Whorf 1956); Lucy's study contrasting Yucatec Maya vs. English (Lucy 1992b). If indeed different cognitive performances arise across speakers of closely-related languages, then linguistic relativity may stand as a theory in general, encompassing remote languages – whereas the reverse is not necessarily true. This concern is theoretical, though, as it is likely that if linguistic relativity were a matter of fact, then it would likely be a matter of extent too.

3.2.1.7. Participants

One of the first considerations in experimental psychology concerns the need for subjects, and participants are indeed a critical requirement in relativity studies. Ideally, as many subjects as possible are required, to enable the data obtained to be representative of at least a consistent portion of the language community under study (e.g. in terms of age, regional provenance, gender, etc.), i.e. external validity (Leach 1991: 13). Subject sample size varies widely across studies, from a dozen (e.g. Levinson 2003) to around 45 speakers of each language (e.g. Gennari et al. 2002). For the sake of external validity as well as practical feasibility, the latter example provides a more reliable index of size sample to draw from.

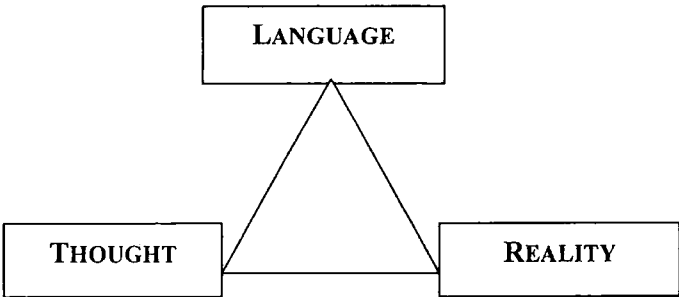
Another important consideration is the requirement for monolingual speakers, or speakers with little knowledge of another language – especially of the languages under contrastive focus. It is paramount to ensure that the language which subjects are supposed to represent constitutes the communicative medium they use principally in their daily lives. Indeed, use and fluency in another language may skew their non-linguistic performance – assuming that relativity is indeed valid.



3.2.2. EPISTEMOLOGICAL APPROACHES

Several approaches may be adopted for the successful investigation of linguistic relativity. No matter which specific aspect of language, thought or reality one focuses on, the original point of departure will find a natural anchor in one of those three variables (see Figure 3.2.).

Figure 3.2. Semiotic triangle of epistemological approaches.



Lucy (1997b) has usefully suggested three specific points of focus for the optimal study of each variable in relation to the linguistic relativity triangle of hypothesised relationships. To approach the investigation of linguistic relativity, one may choose any one of those three focus variables as their start point. Such a choice will influence the empirical development of the study together with the scope and emphasis of consideration allocated to the other two variables, as will be further discussed in the ensuing sections.

A departure from language patterns corresponds to Lucy’s ‘structure-centred approach’ (ibid.) and to the ‘language approach’ defined in this thesis (see section 3.2.2.1.). The rationale behind Lucy’s label reflects his suggestion to focus on differences across grammatical structures in different languages. Structure-centred approaches remain most faithful to Whorf’s original argument concerning the *patternment* of languages as simultaneously the least cultural, the least conscious and the most complex level of language operations and, therefore, the most powerful level of language effects on cognition – and on behaviour ultimately. Lucy’s structure-centred approach therefore examines semantic frames of reference to reality by contrasting the morphosyntactic structures used in two or more languages for this framing. In contrast, as detailed in section 3.2.2.1., this thesis offers an expansion of the epistemological scope of language-centred approaches beyond structural aspects, so as to allow for any linguistic level of meaning-making to be used as a template for the study of linguistic relativity.

An initial focus on the reality variable instead corresponds to Lucy’s ‘domain-centred approach’ (ibid.) and to the ‘reality approach’ proposed in this thesis (see section 3.2.2.2.). Lucy suggests that departing from reality may be best achieved by selecting one of its aspects, or

domain. Such a domain may be more or less narrowly defined, e.g. COLOUR versus TIME. A domain is essentially non-cultural, but experiential instead. In other words, most domains of reality are equally available for experience and conceptualisation to all members of the species, regardless of their native tongue. This availability may be restricted nonetheless on the basis of geography and varying natural environments. A domain-centred approach therefore examines how one dimension of reality is encoded in different languages for expression. From divergent ways of speaking about a domain, it infers divergent ways of thinking about that domain to be tested empirically.

Finally, departing from the thought variable corresponds to Lucy's 'behaviour-centred approach' (ibid.) and to the 'cognition approach' in this thesis (see section 3.2.2.3.). Lucy proposes that an initial focus on thought should examine divergent overt manifestations of cognitive patterns, that is divergent types of behaviour as observed across different language communities. Inferring thought patterns and knowledge forms from behavioural observations is a typical anthropological approach, whereby the unobservable emic unconscious may be best arrived at via its overt realisations, i.e. artefacts in use, displayed behaviour, and symbolic systems (Spradley 1980:11). The behaviour-centred approach to linguistic relativity therefore relates differences in overt behaviour deemed non-cultural (in a non-linguistic sense) to language differences. From this point, researchers may hypothesise diverging thought patterns about reality for empirical examination.

Drawing from Lucy (1997b) therefore, the three following sections will examine the study of relativity as departing from each of those three variables in greater detail. Furthermore, Lucy's epistemological approaches will be offered enhanced breadth of scope, to allow a departure from language which may enable more focus options besides grammatical structures, and greater fine-graining of epistemologies becomes represented for the other two variables at the domain and cognitive levels.

3.2.2.1. Language Approach

In contrast with Lucy's (ibid.) structure-centred approach, the point of departure proposed for a *language* approach consists of any linguistic means for encoding the semantics of reality. Semantics may be mediated via divergent aspects of language, ranging across e.g.

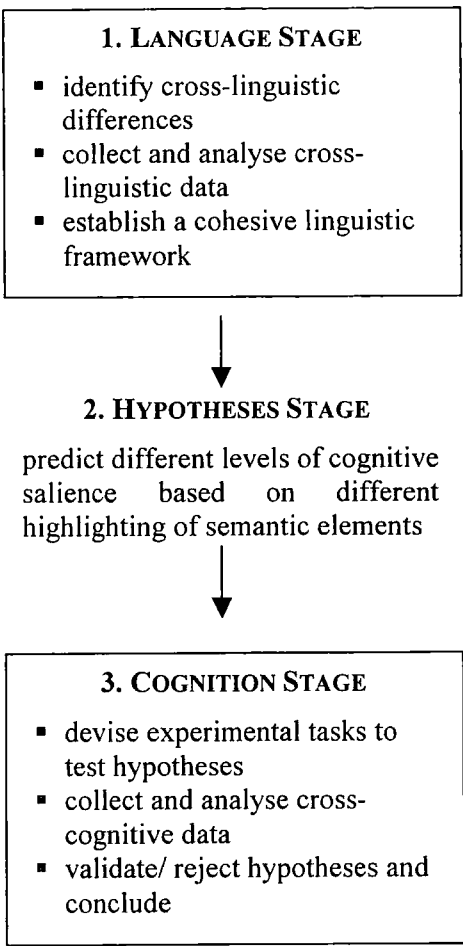
- (10) The lexical level, e.g. terms used for reference to genealogical relationships (e.g. Danziger 2001), adjectives used for reference to colours (e.g. Brown & Lenneberg 1954), nouns used for reference to body parts (e.g. Majid et al. 2004),
- (11) The pragmatic level, e.g. indexicals used for reference to contextual features (e.g. Silverstein 1976b),

- (12) The metaphorical level, e.g. metaphors used for reference to abstract domains (e.g. Lakoff 1987),
- (13) The morphological level, e.g. case-marking for reference to semantic features of animacy (e.g. Silverstein 1976a, 1980), marking for reference to number (e.g. Lucy 1992b),
- (14) The structural level, e.g. syntactic patterns for reference to motion events (e.g. Papafragou et al. 2002, Gennari et al. 2002),
- (15) The modality level, e.g. modality used for language behaviour, such as writing systems, signing, orality, literacy, etc. (e.g. Chan & Bergen 2004),
- (16) The discursive level, e.g. habitual ways of speaking about events (e.g. Slobin 2003a).

The question this approach attempts to elucidate is how reality domains are semantically construed by linguistic artefacts. Its hypotheses therefore relate the different interpretations of experience based on those different configurations of meaning. In order to flesh out those differences, the approach – like any other – entails the cross-examination of two or more communities, in this case using divergent systems of linguistic configuration.

Typical investigations following this epistemology, such as those suggested in (10)-(16), proceed from the identification of a linguistic difference existing in at least two languages at any of the levels highlighted above. From an in-depth analysis and understanding of language patterns, the procedure then consists of determining what aspects of reality are ‘said’ and which are left ‘unsaid’ in the contrasting languages. The ‘said’ is hypothesised to be foregrounded information in speakers’ attention, so that the elements of reality requiring linguistic expression become salient in speakers’ conceptualisation of that aspect of reality. Investigators then proceed to devise non-linguistic tasks – the same for each language group – in order to gauge attentional levels to the particular dimensions of reality contrasting in their linguistic grounding across the languages under examination. The procedure therefore examines speakers’ non-linguistic behaviour – typically on cognitive tasks – with the aim of establishing whether cognitive behaviour is (a) consistent across speakers of the same language in ways predicted by the linguistic analysis of semantic grounding, and (b) divergent across speakers of the different languages in ways predicted by the differences identified in the linguistic analyses of semantic grounding. These steps of the cognitive analyses enable the researcher to either validate or reject the hypotheses in support of linguistic relativity. In other words, the procedure follows a specific sequence of study stages for a successful investigation (see Figure 3.3.).

Figure 3.3. Epistemological stages in the language approach.



The language approach therefore starts from the identification of a linguistic focus of study on a particular domain of experience, e.g. COLOUR, KINSHIP, GENDER, NUMBER, TIME, SPACE. It consists of theoretical research on the lexicalisation resources and linguistic frames offered by different languages for encoding the same domain. Naturally, this stage should endeavour to focus on a domain that is semantically realised differently in the chosen languages. The linguistic stage of the study should also involve the empirical collection of data, e.g. corpus, typological, natural, elicited, together with linguistic analyses of that data, so as to ensure an in-depth investigation of the linguistic reality of the domain under focus. A further aim of empirical studies is to ensure that the identified linguistic differences correspond to pervasive lexicalisation patterns yielding particular discursive styles, i.e. the differences should be consistent and representative rather than ad hoc, e.g. dialectal. In this sense, data collection intends to assess the level of intralingual homogeneity of the linguistic patterns under examination.

Such a thorough survey of the linguistic means available for encoding a particular domain then makes it possible to establish the conceptual elements of that domain likely to receive

greater or lesser cognitive salience across the language groups under comparison. At this stage, researchers are able to make language-based hypotheses for divergent cognitive aspects, e.g. attention, memory, categorisation, inference, across the said language populations.

The next stage then represents a disciplinary shift away from linguistics to experimental psychology. This stage represents the crux of the investigation, as its data will determine the validity of the hypotheses. It involves the appropriate design of relevant cognitive tests to assess the cognitive differences expected. The central consideration in this stage is to present the same non-linguistic stimuli to native speakers of different languages, and to require the speakers to perform exactly the same tasks. This consideration ensures that responses are then comparable within and across language groups. Tasks must further endeavour to exclude language-based answers, so that subjects' performances are cognitive in a non-linguistic sense. This consideration should prevent possibilities of argumentative circularity. This stage must also incorporate the methodological concerns described in section 3.2.1. to ensure experimental rigour and scientific validity. Finally, the analyses of the cognitive data should aim to use the same strategies and tools for all subjects' responses, to ensure complete and transparent comparability. These analyses will further seek to correlate cognitive response patterns to language patterns, in order to assess the potential for parallel patterning. Such a parallel would be indicative of likely effects of language patterns on cognition – and thus of linguistic relativity effects, i.e. the ultimate objective of the investigation. If indeed cognitive performance differs in consistent ways across language groups and in a manner that parallels their respective linguistic patterns, then a sound correlation may be postulated between language and cognition, in which language plays an active influential role – at least with regards the given domain under examination.

The main strength of this epistemological approach is the thoroughness and depth of the linguistic analyses. Such an understanding is complex, yet it is a sine-qua-non for the successful outcome of any study on linguistic relativity. Inaccurate analyses of language patterns entail skewed hypotheses and therefore vacuous empirical efforts, with little potential for scientific validity. Another considerable advantage of a language-based epistemology resides in the fact that each language meaning system is analysed in its own terms (Lucy 1997b). In-depth linguistic analyses should therefore prevent researchers from imposing their own biased framework of understanding, both in linguistic and in cultural terms, onto the aspect of reality under study. Such unconscious self-projections naturally lead to ethnocentric and linguacentric positions, which jeopardise the scientific validity of the research project:

When investigating linguistic relativity, we become entangled in some aspects of it right in the linguistic analysis itself. We need to be aware that we carry a lot of linguistic baggage to our own interpretive work with the language: we may ignore important features of the language, we may misanalyse them, and we may embed our misunderstandings right in our working terminology (Lucy 2003: 25).

The analyst's tendency to expect and seek their native meanings in the foreign code under study is an obvious pitfall – also termed 'semantic accent effect' by Lucy (2003) – which requires significant consideration. The linguist may ideally be a native speaker of the several languages under examination. Typically failing this, a high degree of metalinguistic awareness seems paramount to minimising this tendency, with the addition of a 'neutral' terminological jargon for scientific analysis (Lucy 1992b: 266). A further remedy may be for the analyst to use the experiential domain corresponding to the language aspect under study as a neutral, conceptual springboard for descriptive analysis of the language. Indeed, a domain provides 'objective' (i.e. non-semantically construed) elements that may be used as guides to the aspects of reality a language may express relating to that domain. It is critical to appreciate and try to circumvent the subversive nature of linguacentrism and 'semantic accents,' as

Most research on linguistic relativity falters by a failure to appreciate the power of semantic accent effects (...) the effects have conspired to derail nearly all research on linguistic relativity before we even get to an empirical test in the nonlinguistic realm (Lucy 2003: 17).

A language-based epistemology thus contains a number of difficulties and potential problems, which must be especially borne in mind when proceeding with analyses and experimentation. For instance, because there is no frame for comparison, as each language's semantic system must be taken in its own right, a contrastive appreciation of the different meaning systems and of their implications for cognition and behaviour can be rather loose, if not partial. Indeed, as this approach examines the linguistic construal of a domain rather than its experiential reality, the calibration of linguistic domain construals across languages is by no means transparent. Their comparability may therefore be rendered elusive. For instance, a study focusing on tense in e.g. English and Chinese cannot fairly extrapolate the lack of a semantic system for TIME and PROGRESSION in Chinese due to its lack of a tense-marking system. The researcher may then wish to broaden the investigation scope beyond tense. In so doing, the project becomes reality- or domain-centred, as it would take the concept of e.g. TIME as its new focus. As detailed in section 3.2.2.2., doing so may generate further difficulties, as the linguistic scope could become too broad, ranging across grammatical and lexical categories, which are then no longer comparable from a structural perspective. Note too that incorporating further linguistic categories into the examination does not solve the difficulty of semantic and conceptual

calibration and comparison. If anything, it may alienate the enterprise further. In sum, the core issue here is that the linguistic interpretation of a domain in itself redefines the domain along conceptual dimensions differing across languages, for which no ‘norm’ operates. We thus come to reiterate the need for a language-neutral rationale for purposes of basic comparability (as discussed above):

In deciding upon the particular terms to examine in a given language, then, we confront a specific version of the “mapping problem” of semantics in general: that is, the suspicion of one’s own intuitions about reality, leading to a general despair about the possibility of comparison under true relativism (Danziger 2001:29).

To circumvent this initial problem, this thesis advocates combining a language approach with a reality, or domain, approach (see section 3.2.2.2.) – as already hinted at above. The aim is to ensure that the domain is analytically grounded in non-linguistic experience, rather than in hermeneutic realities only. Indeed, an experiential approach provides a framework of a non-interpretive nature, i.e. a rationale the same for all observers, with identifiable variables providing the neutral ‘norm’ necessary for comparative studies.

In addition, linguistic analyses can easily become very complex or idiosyncratic, thus further complicating a comparative epistemology of semantic construals and its resulting conceptual representations. A solution may be to focus on restricted sets of linguistic resources, such as the semantic definitions of body part nouns (e.g. Majid et al. 2004); yet, narrow linguistic focuses tend to restrict the scope of the relativistic implications of the findings, in that limited sets of open-class items, for instance, offer little insight into the large-scale dynamics of the language-thought-reality triangle existing in the contrasted languages. One may therefore decide to investigate more pervasive morphosyntactic patterns, rather than lexical fields of reference, as Lucy (1997b) strongly suggests. Yet, because the types of concepts expressed by morphosyntactic patterns (e.g. tense, aspect, number-marking) have rather encompassing meanings, they are often difficult to correlate with overt patterns of behaviour and cognitive functioning. This type of behaviour is best studied via qualitative methods, given the flexibility of its definition, and, moreover, ethnographic data is not overtly relevant to documenting the types of conceptions people may have of time, or space, or quantification and the like.

An example of research adopting a language approach is Lucy’s (1992b) contrastive morphosyntactic study of English and Yucatec Maya on quantifiable object conceptualisation via the grammatical treatment offered to number-marking patterns on nouns. Plural number is obligatorily marked in English for reference to bounded – and hence ‘countable’ – units (i.e. most nouns); whereas number is optionally marked in Yucatec for a few nouns only. In addition,

Yucatec is a classifier language using modifiers within a system of inflection to mark number in NPs. Yucatec nouns do not specify the idea of UNIT, but only that of SUBSTANCE (e.g. SUGAR, WAX, WATER, CARD, PLASTIC). In short, the two languages differ in their treatment of the domain of QUANTITY so that (i) number-marking in Yucatec is optional, whereas it is obligatory in English, and (ii) number-marking in Yucatec is determined by the referential feature of animateness, i.e. [+animate] NPs are marked and [-animate] NPs are not marked; whereas in English the referential feature is that of discreteness, i.e. [+discrete] NPs are marked and [-discrete] NPs are unmarked (see Table 3.2.).

Table 3.2. NP number-marking in Yucatec & English.

		NP Types		
	Referential features	[+animate] [+discrete]	[-animate] [+discrete]	[+/-animate] [-discrete]
Yucatec	Number marking	YES	NO	NO
English	Number marking	YES	YES	NO

As mentioned above, Yucatec number-marking remains optional despite the availability of linguistic means and rules for number. The Yucatec category of number-marking thus corresponds to Whorf’s covert grammatical categories; i.e. marking in Yucatec is a covert category, so its meaning is more elusive, as the grammatical category of number marking is not obligatory and, thus, speakers do not have to pay attention to it when speaking. In other words, the semantic representation of this category should entail a lower level of cognitive salience to the QUANTITY CR for Yucatec speakers, than expected with English speakers, whose language treats number-marking as an overt category, and who should thus be maximally aware of number in general.

Lucy further identifies the semantic units determining the features of discreteness and animateness as corresponding respectively to shape for English usage, and to substance or material composition for Yucatec. This calls forth a further level of relativistic hypothesising, so that we may predict differential salience of shape vs. material/ substance (ibid.: 89).

In short, Lucy sought cross-speaker differences in terms of cognitive sensitivity to number in general, and further to the concepts relevant to marking number in the two languages. Lucy implemented several cognitive experiments ranging from description tasks of pictures to recall tasks, non-verbal similarity judgements, and recognition tasks. He therefore assessed memory, attention, and judgement, among other cognitive functions. Lucy’s data revealed significant and consistent differences showing a greater sensitivity to number in general by English native

speakers, as well as differential preferences in associative thinking for either boundedness (shape-based common features) or for substance/ material properties – hence offering valid support to linguistic relativity via a language approach to the domain of QUANTITY.

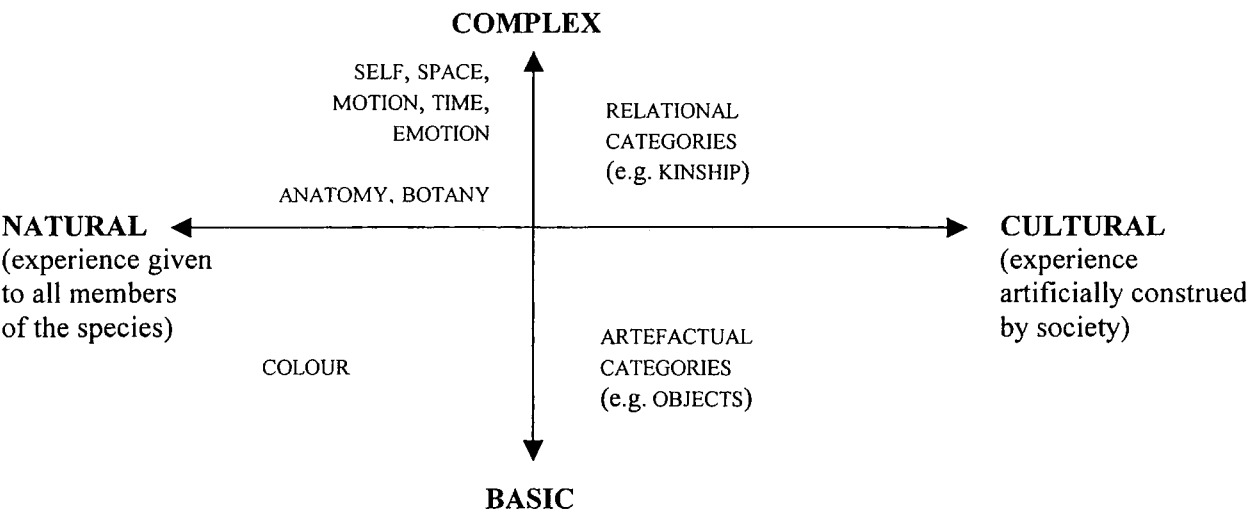
3.2.2.2. Reality Approach

As suggested by Lucy (1997b), approaching linguistic relativity via reality may be best achieved through the examination of experiential domains of life, e.g. MOTION, VISION, KINSHIP, POTANY, COLOUR, EMOTION, etc. In other words, the approach departs from a non-linguistic facet of reality, that is, a non-linguistic fact of human experience with the world. The question addressed is then how given domains are encoded by different language communities for expression. Such an approach then entails the neat delineation of aspects of reality. From there on, its hypotheses seek to relate the linguistic handling of domain referentiality to cognitive patterns related to that particular domain. A domain focus further entails ease of comparability across language groups, i.e. providing that the domain is non-cultural, it should exist in all human groups.

Theoretically, the level of control over the dynamics of the domain is optimal, and so is the level of control over the linguistic resources for that domain. This point, however, holds true for restricted domains mainly. For instance, reference to COLOUR or to ANATOMY is typically handled by a small set of lexical items, whereas reference to TIME or SPATIAL LOCATION may include a large set of lexical items, different grammatical categories and relations. In other words, domains may display varying levels of complexity in their very ontology, as well as in their conceptualisation in human cognition and in their meaningful construal in language. In this light, it may be useful to fine-grain the reality approach to relativity, as empirical epistemologies for researching domains of varying levels of complexity are hardly bound to meet similar outcomes and success of investigation.

Therefore, distinctions between domain types need to be made, as basic, biologically-derived domains (e.g. COLOUR PERCEPTION) and complex, culturally-elaborated ones (e.g. KINSHIP NETWORKS) are unlikely to yield similarly telling results on the relativity question, and therefore, are unlikely to require similar experimental approaches, and to be comparable. Domain types may be conceived of along two main axes – one axis in terms of the nature vs. culture angle, and a second axis in terms of schematic complexity (see Figure 3.4.).

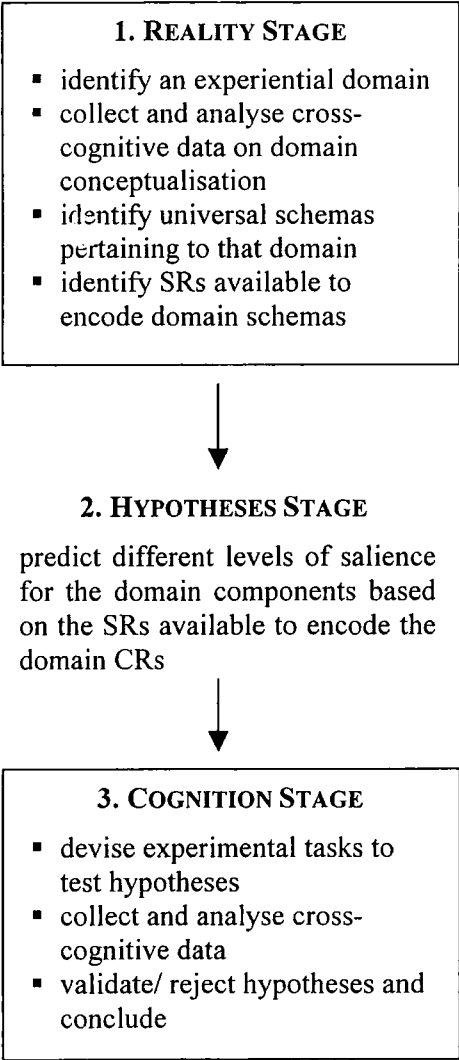
Figure 3.4. Dual axis of domain differentiality.



The more complex a natural domain, the more it becomes locally (i.e. culturally and linguistically) malleable. Its schematic complexity leads to multiple ways of representing the domain conceptually *and* symbolically. Though all members of the species are equally able to generate any of these representations (because the domain is natural/ given), the local culture may privilege the preferential use of one representational type, thus leading to cross-cultural and cross-linguistic variation, and from there, hopefully cross-conceptual differences. Conversely, basic domains – especially natural ones – are less likely to yield cross-conceptual, cross-cultural and cross-linguistic variability. Therefore, we may expect applications of linguistic relativity to be more productive at the complex end of the schematic axis.

Furthermore, when studying a domain of a complex nature, it is important to consider fine-graining the epistemological approach by (a) identifying its conceptual components (e.g. image schemas), and (b) analysing the linguistic and conceptual representations of these atomistic concepts prior to an overall analysis of the domain as a whole. The purpose of these additional stages of analysis is that just as we have incomplete linguistic analyses of structures impeding the validity of relativistic studies, we may also have incomplete conceptual analyses of domains resulting in similarly invalid conclusions. Such analytical rigour should therefore prevent hasty research in studying the language-in-cognition question.

Figure 3.5. Epistemological stages in the reality approach.



The reality approach therefore starts from the identification of a domain of study, as semantically encoded differently in two or more languages. The approach entails theoretical research on the chosen domain and its conceptual components, as well as experimental explorations into the universal and variable dynamics of that domain’s conceptualisation. However, departing from reality is not done blindly of linguistic facts. Linguistic encodings of the domain may be considered either simultaneously, that is, the researcher identifies a domain realised differently across two languages. In this sense, the reality approach may combine with the language approach. Alternatively, the domain focus is exclusive to begin with, and the researcher later seeks languages using differing linguistic means to refer to it. This latter approach may be more easily implemented when investigating small-scoped domains, e.g. COLOUR, for which lexical resources are limited and thus easily within analytical grasp, regardless of the researcher’s linguistic competence in the languages under consideration. The approach thus inevitably necessitates a linguistic component, despite its departure from non-

linguistic reality. Linguistic research, as in the language approach, may be pursued theoretically, empirically, or ideally both theoretically and empirically. It is fundamental that research should seek an in-depth understanding of the language resources existing in the language communities under study. As such, the reality approach incorporates the analytical elements detailed in the language approach at an early stage.

The thorough understanding of the conceptual and linguistic dynamics of the domain under focus then enables hypotheses to be generated regarding language effects on the conceptual salience of domain components. The final stage of the procedure is convergent with that described in the preceding section. It entails the design and implementation of cognitive tasks to assess the validity of the hypotheses.

The main strength of the reality approach resides in the analytical rigour involved in the domain analysis. The approach presented in this thesis advocates a domain analysis starting at the atomistic level of image schemas and other conceptual components, or dimensions, of the experiential aspect of reality under examination. This approach differs from Lucy's (1997b) domain analysis by suggesting the cognitive exploration of image-schematic representations of domain 'atoms.' At this atomistic level, researchers are better able to discriminate between universal CRs and those CRs which are likely to fluctuate across speakers due to various factors, including their cognitive complexity, cultural elaboration, or other. This in-depth analysis should enable researchers to identify not only different schema types, but also the likely sources of elaboration for those CRs showing conceptual fluctuation across individuals. Identifying such sources should help distinguish between the environmental factors likely to influence cognition, e.g. literacy, material culture, language. In other words, the careful nature of the domain analysis presented here should offer great control over that domain, and over the design of experimental tasks in the latter stage of the empirical procedure.

Another bonus in this approach relates to the control one may exert over the linguistic resources, as is the case for restricted domains, as discussed above. For instance, a domain such as COLOUR is typically restricted to half-a-dozen single lexical items in languages. This renders the linguistics of the project much simpler to cope with. On the other hand, a domain such as MOTION (see Chapter 5) is much less restricted in conceptual and referential scope, involving linguistic analyses across grammatical categories, analytical levels (e.g. word-, sentence-level), lexical resources, patterns, and semantic means of expression (e.g. syntactic, pragmatic, etc.).

This latter example, therefore, illustrates one of the weaknesses of reality approaches. Indeed, the neat delineation of an experiential domain does not entail its equally neat delineation in the linguistic forms used to refer to it. A reality approach entails the examination of all the

resources available in language to encode given domains. These resources may span across non-cohesive categories and result in an eclectic collection of syntactic relations, lexical items, and so on, thus preventing linguistically homogeneous analyses. This inevitably renders linguistic analyses within one language highly complex, and cross-linguistic comparisons difficult to achieve with semantic precision. One may thus restrict the linguistic means under consideration, e.g. to examine nominal forms only; yet, such restrictions may discard important linguistic means of expressing the domain, thus rendering the language-based hypotheses dubious. On the other hand, incorporating all possible linguistic means is likely to entail the consideration of forms in limited usage alongside forms in idiomatic use. In this case, the study is not contemplating cohesive fashions of speaking, that is, semantic patterns of salience which may have equivalent salience in conceptualisation. As a result, the hypotheses may be partially ill-founded, and were language effects to be found in cognitive tasks, it would not be straightforward to identify what kinds of implications may be derived regarding individual and collective cognitive patterns. A possible remedy to these problems is to adopt a communicational approach to the language data collection, in order to seek those idiomatic fashions of speaking about the given domain. High numbers of informants and quantitative analyses is required to ensure the linguistic means identified are representative of the language in question.

Most reality approaches thus avoid complex domains. Instead, they tend to examine narrow domains affording linguistic control. However, such narrow domains entail the examination of narrow semantic fields and slices of reality. The problem then becomes two-fold. First, the language items under study fail to be representative of the language as used in individuals' daily lives; thus, were the hypothesis to be validated, the extent of the impact of language forms on cognition would be restricted to a small range of life experiences. Secondly, it may therefore prove impossible to relate such isolated effects to a community's worldview, or subjective philosophy. Indeed, worldviews encompass notions beyond small-scoped domains, such as BOTANY, COLOUR, or BODY PARTS (c.f. section 3.1.3.2.). As such, the Whorfian argument relating language to collective cognition and worldviews becomes inconsistent, if not ad hoc altogether.

In order to prevent the above difficulties, this thesis suggests that combining a reality approach simultaneously with a language approach – as mentioned above – constitutes the most efficient epistemology of study. This combination enables the in-depth schematic analysis of a well-delineated domain together with the in-depth linguistic analysis of idiomatic fashions of speaking about that domain. This approach may further choose to restrict the initial range of

linguistic communities under study to two, due to research logistics. It would nonetheless permit the broadening of the reality scope, so as to exclude narrow domains. The examination of domains pervasive in individual experiences seems paramount to the Whorfian goal of relating language effects to collective as well as to individual cognition, hence reaching out to societal concerns, such as worldviews, behaviour, and culture.

Notable examples of reality approaches include the colour tradition of research started in the 1950s, as reviewed briefly in section 2.3.3. (e.g. Lenneberg 1953; Brown & Lenneberg 1954; Berlin & Kay 1969). The COLOUR domain, however, is highly restricted in scope and implications. Furthermore, colour perception is a bio-physiological ability, with little amenability to cultural elaboration. It may be noted, nonetheless, that more recent investigations focusing on colour codability in language have reported codability effects on judgement and memory for colour (e.g. Kay & Kempton 1984, Lucy & Shweder 1979).

A more recent empirical study following a reality approach, combined with a language approach, is Levinson's (e.g. 2003) research on SPATIAL LOCATION. This domain is considerable in conceptual scope, whilst also being linguistically restricted in the forms available to refer to it. In other words, this research illustrates an ideal set of study conditions for linguistic relativity. Levinson's in-depth domain analysis identifies the existence of three possible frames of locational reference, (a) the intrinsic frame using object-centred coordinates, e.g. object sides (e.g. *top of, on the side of, under, behind*), (b) the relative frame using viewer-centred coordinates (e.g. *right, left, behind, ahead*), and (c) the absolute frame using fixed coordinates, e.g. local landmarks, cardinal points (e.g. *upstream, north, south*).

Linguistically, a community using an absolute system may not have linguistic equivalents for RIGHT and LEFT. Systems may also combine; however, one frame of reference will tend to predominate in a language and characterise a fashion of speaking about spatial location. Levinson (2003) and Max Planck colleagues examined a variety of languages, e.g. Tzeltal, Zapotec, Mopan, Yucatec, Tamil, Longgu, Japanese, Dutch, in order to define a thorough introductory 'grammar of space.' The conclusion that emerges is the overwhelming lack of uniformity in cross-linguistic spatial semantics.

Levinson proceeded with an empirical investigation to discover whether this semantic diversity results in cognitive diversity in spatial conceptualisation. The investigation is justified by the untranslatability of linguistic frames of reference. Furthermore, Levinson suggests that the sensory capacity for spatial awareness (e.g. way-finding) is not innate in humans, but that it must be learnt through enculturation (e.g. via language coordinate systems). This assumption is well documented by frame-of-reference acquisition in language and by data from relative-frame

users, who typically demonstrate a poor ability to compute absolute landmarks, such as compass points. This lack of a fundamentally universal perceptual basis for spatial cognition contrasts with the ambiguous colour tradition mentioned above, and helps contribute towards the suitability of this domain selection for the study of linguistic relativity.

Levinson turned to experimental psychology to test non-linguistic cognition, e.g. memory, inference, mental modelling, attention. Experiments included pointing, gesture, and spatial manipulation tasks. Levinson used a battery of non-verbal tasks to elicit cognitive-only responses with speakers of over 13 different languages. He reports astonishing differences in cognitive responses from contrasting frame-of-reference users, so that, for instance, absolute users monitor fixed bearings with staggering speed and accuracy (~4% error rates) whereas relative users fail consistently at absolute monitoring. Overall, results confirm that the spatial performances of language groups differ systematically, in agreement with their respective language-framing perspectives. This research thus provides a useful example of a reality approach offering strong correlations between linguistic and non-linguistic behaviour, by suggesting that language patterns for spatial reference influence cognitive functions for spatial computation.

3.2.2.3. Cognition Approach

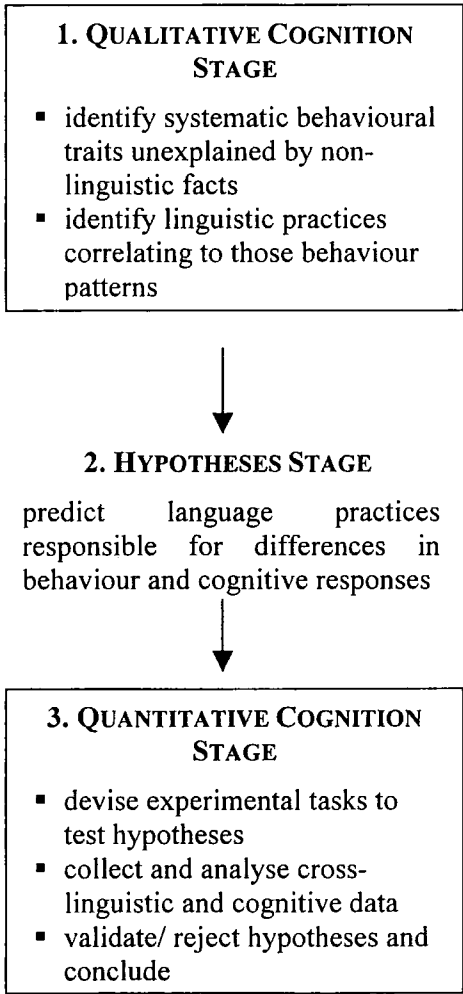
The point of departure in this third and final approach consists of behavioural differences across two or more language communities, as generated by patterns of collective cognition. This corresponds to Lucy's (1997b) behaviour-centred approach. The behavioural differences of concern here must be rather substantial to be of interest. Furthermore, they must appear not to be caused by any extra-linguistic variable, such as material culture, ecological environment, ideology and the like. The question this approach seeks to explore is therefore how language patterns may account for the differences observed in overt behaviour. The hypothesis would therefore aim to relate behavioural patterns to linguistic patterns.

The procedure followed in this epistemological approach typically entails a holistic approach to observing behaviour, e.g. ethnography. The point of focus being collective cognition, its in-depth study is a *sine-qua-non* for the success of this approach. Such studies necessitate more qualitative investigations than the two approaches outlined above. Behaviour must be observed extensively, hence requiring time and logistic access, so as to determine the causal dynamics within collective interactions. By no means should this ethnographic approach preclude the comparative dimension necessary in linguistic relativity, and therefore, such observations must be implemented in at least two communities. The time and involvement burden required in such investigations entails that few studies of this nature actually exist

(however, see below for examples); in fact, such projects are typically stumbled upon rather than designed from scratch. In addition, researchers may wish to restrict the size of the community involved in the study for the sake of feasibility, to e.g. primary-school children, male factory workers, a small tribal unit, etc. Team-based research may also be more productive in such endeavours.

The observations require the identification of specific and systematic types of behaviour, differing in manifestation from other communities. These types of behaviour represent particular ways of thinking about and living in the world, and may thus have correlates in fashions of speaking about the world. Research must then establish the correlation between those types of behaviour and linguistic practices, and must therefore examine other types of practices and discredit them as non-causal.

Figure 3.6. Epistemological stages in the cognition approach.



The advantages of this approach mainly comprise of the significance of the gathered data. Differences at the behavioural level have obvious implications and potential applications at the

individual and collective levels. Such differences imply equally substantial cognitive differences. The interest here is that those cognitive differences are unexplained by extra-linguistic factors, and yet are considerable enough to generate observable patterns of collective behaviour. Such differences are therefore not ad hoc, but instead are integral to a way of being and living in the world. In other words, they are constitutive of individual identity and group ethos. Behavioural patterns relate to collective worldviews, and by their overt nature, render the topic of relativity palpable in an observable format. This scale of investigation is thus highly conducive to gathering convincing evidence for the Whorfian hypothesis.

In addition, the methodology necessary to tackle group behaviour is optimally qualitative, and entails the contextualisation of behaviour, cognition and language in a holistic research paradigm. Such methods of investigation are notoriously valid with regards (a) their ability to discriminate between sources of impacts on behaviour (including cultural contextualisation), (b) the depth of emic insight into native worldviews, (c) the encompassing understanding of the dynamics of a community's cognitive life, and (d) the avoidance of ethnocentric and linguacentric tendencies. This approach thus fully incorporates consideration of worldviews, by focusing on group, rather than individual, cognition. Their downfall, however, resides in the possible subjectivity of analysis, or even in inverted ethnocentrism (i.e. the adoption of native values and meanings). Yet, should this approach be combined with quantitative measures for linguistic and cognitive assessment – as suggested in the final quantitative procedure stage in Figure 3.6. – any likely subjectivity of understanding should be successfully removed from the study.

Nonetheless, this epistemology retains a number of difficulties. The obvious concern pertains to the rigour brought to the linguistic and cognitive analyses. Indeed, the researcher must effectively search for linguistic practices correlating to specific behaviour differences. This may be seen as amounting to guess work, which fails to constitute a reliable indexing method of consistent grammatical patterns or functional fashions of speaking. This is especially of concern when considering that the patterns identified in one language community must be evaluated against equivalent patterns in another language community. The feasibility of comparing two communities' behaviour, as well as the linguistic resources hypothesised to be the cause of diverging behaviour becomes questionable.

In addition, cognitive tests in the final stages of the procedure may be difficult to devise for linguistic influences over general behaviour patterns when departing from a loose basis for linguistic comparison without specific reference to some domain or category of experience, and when the characterisation of behaviour is broad or possibly underspecified. As mentioned

previously, rigorous cognitive assessment is critical to valid findings in linguistic relativity, hence this stage must be closely attended to. A qualitative and holistic departure of investigation may render such quantitative testing complex, as the researcher must then control for external variables and test individual cognition. It is also possible that such tests are feasible, and yet the results may be inconclusive due to the sudden individuation and decontextualisation of naturalistic group behaviour.

Finally, it is important to consider the logistics of such investigations. Such an epistemology requires the researcher to be skilled (a) in ethnographic methods of observation and documentation, (b) in linguistic methods of data collection and analysis (in at least two languages), and (c) in experimental psychology methods of cognitive testing procedures. Further, the qualitative nature of this approach is consuming in both time and effort to an extent much greater than the two previous approaches. These issues are relevant when considering that the identification of a causal effect of language practice on non-linguistic behaviour is not granted outright. In short, the conclusive nature of this type of research for linguistic relativity is not guaranteed overall, thus, the efforts may outweigh the outcomes.

Such studies nonetheless exist. The most famous is possibly Bloom (1981, 1984) on moral reasoning contrasting Mandarin Chinese and English language communities. Bloom noted that Chinese speakers found counterfactual questions difficult, and traced the difficulty to the linguistic marking of counterfactuals in the two languages. He identified Mandarin counterfactuality as a covert grammatical category subject to pragmatic constraints, and thus receiving little idiomatic use in everyday language. In contrast, Indo-European languages such as English mark counterfactuals overtly, and use such constructions with high regularity in language practices. Bloom devised comparative tests to assess the reach of the differences in understanding and conceptualisation across speakers of Mandarin Chinese and English. He used texts and sentences, together with their translations for comparability, and administered a number of questions relating to the semantics of the stimuli. Bloom's findings validated his hypothesis concerning the impact of counterfactual linguistic marking on cognitive reasoning about hypothetical situations. However, Bloom's linguistic analyses were only partial, and he examined a discursive register encompassing several different structural patterns with little consistency (Lucy 1997b: 303). In addition, his research lacks further experimental observations of natural behaviour. Another problematic issue in his methodology was that his testing stimuli and subject responses relied crucially on language-based materials, causing his work to suffer from circularity. Finally, his translated texts have been heavily criticised for their inaccuracy (e.g. Au 1983, 1984). Though Bloom's research is highly relevant to showing the value of the

cognition approach, it unfortunately displays methodological weaknesses preventing it from constituting valid evidence in support of linguistic relativity.

3.2.3. SUMMARY

This section has shown that though difficult to investigate, linguistic relativity is a topic highly amenable to empirical research. Researchers fundamentally need to study aspects of language, cognition, and reality. Linguistically, one may typically explore (i) sets of lexical items delineating a semantic domain, (ii) grammatical patterns organising the structure of a domain's relations, or (iii) functional clusters of features defining fashions of referring to a domain. Cognitively, tests may be devised to correlate any of those language aspects to cognitive functions ranging from perception, to memory (e.g. recall, recognition), categorisation, concept formation, inference, decision-making, problem-solving, and so on. Such testing may be done in controlled experimental set-ups, e.g. cognitive tests, scenario-based manipulation tasks, neuropsychological assessment; and/ or in everyday natural behaviour through observations of a more general nature (including cultural behaviour). Ideally, both types of observations are required to ensure quantitative accuracy and control, and qualitative contextualisation.

Investigations must pay special attention to methodological and analytical requirements of rigour, given the difficulty of reliable testing in cognitive matters, the complexity of linguistic understanding and semantic calibration, the elusiveness of behavioural observations, and the overall controversy surrounding the linguistic relativity hypothesis. Therefore, it is imperative that relevant data collection and in-depth analyses of language aspects, domain properties, and cognitive behaviour be implemented with equal scientific consideration. This entails that research may at times depart from its relativistic purpose in order to establish an accurate understanding of the variables under focus, i.e. the chosen domain, cognitive tasks, and linguistic focus. To this end, for instance, it is just as important that researchers analyse language as used by a representative sample of the population – rather than relying solely on corpus resources and existing analyses – as it is that they develop pertinent non-linguistic stimuli and design appropriate cognitive tasks to obtain psychological data undistorted by overt language use, either in the stimuli, the test forms, or the type of answer required.

In addition to rigorous methods, extra concerns must also bear on the necessity for a comparative epistemology, hence requiring linguistic proficiency in all the languages under study. This proficiency is crucial for the semantic analyses of the language aspects to be focused on, and for the avoidance of linguacentric tendencies. It is also useful for interacting with speakers of both language communities, e.g. in qualitative data collection such as interviews,

debriefing sessions following controlled tasks, instructing previous to controlled tasks, and so on. The need for subjects is indeed a *sine-qua-non*, yet attention to individual profiles is important in the control of external variables, e.g. literacy, age, education, proficiency in foreign languages, etc. It is also paramount to obtain a group of subjects large enough to ensure reliable and representative quantitative data, whilst ensuring that both language groups are of similar size for comparative purposes.

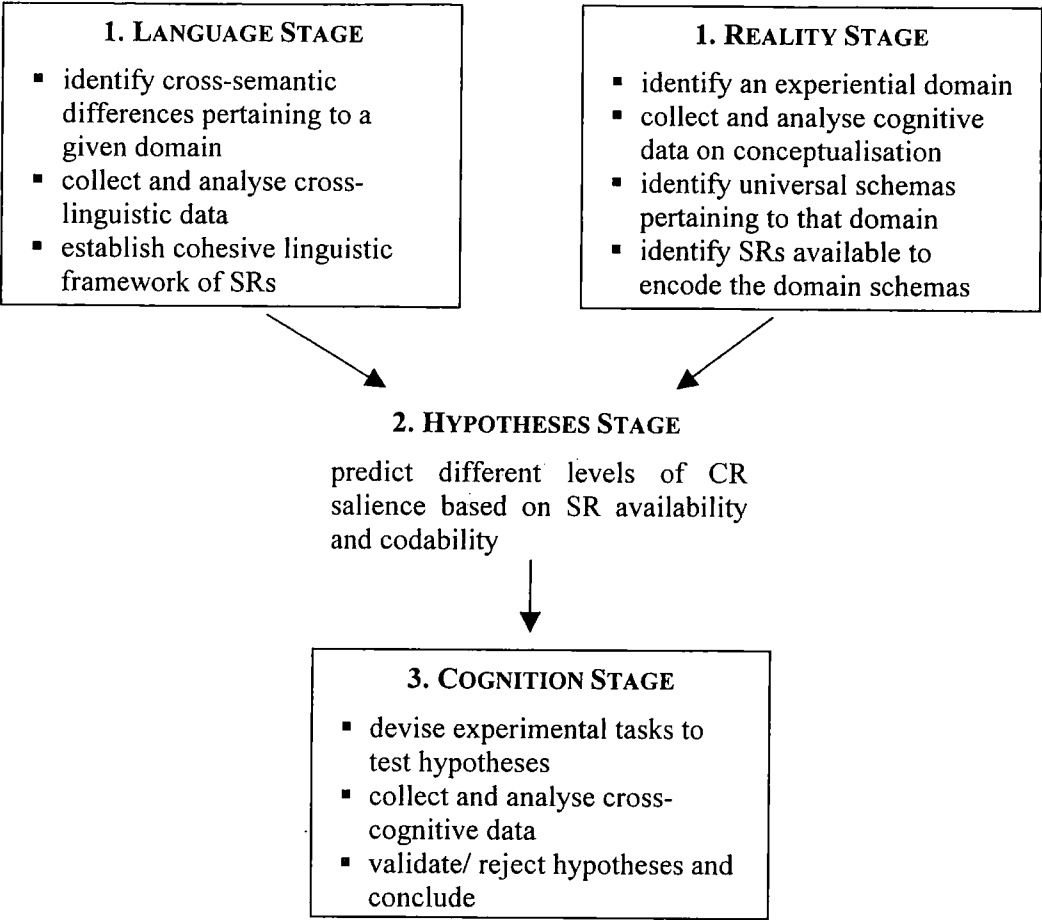
These concerns (as detailed in section 3.2.1.) are foundational regardless of the epistemological approach chosen for investigation. Whether it departs from language, cognition, or reality, the relativistic study involves essentially the same difficulties and pitfalls – given the interconnectedness of the three variables, and the constant endpoint of cognition. Concerning specific epistemologies, this section has further suggested that combining departure points may prove the most efficient approach to linguistic relativity. As only just mentioned, the three variables language, cognition, and reality, are hypothetically interconnected; hence, their analytical independence (c.f. Lucy 1992a: 264) is theoretical only, and as such it cannot be empirically sound. As indeed, Foley (1997: 209) notes:¹⁰

It is not clear that [the] operational separation of language and thinking is consonant with Whorf's own views.

In addition, combining departure points may entail combining the strengths whilst compensating for the weaknesses of each approach. These two points imply more truly interdisciplinary efforts, together with greater rigour of study. The present discussion proposes a combined language-reality approach (see Figure 3.7.), which will be illustrated through empirical treatment in the third part of the thesis.

¹⁰ See also Lee (2000: 46, 55) and Lee (1996: xiv) for similar criticisms.

Figure 3.7. Epistemological stages in the combined language-reality approach.



An understanding of language as cognitive (as outlined in section 3.1.) suggests that the study of language is about the study of the referentiality of meaning to reality. The enterprise further assumes – uncontroversially so – the classificatory nature of language. Hence, language constitutes classificatory semantic systems of reality. This understanding entails that the identification of a linguistic frame delineates to an extent a reality domain, and vice versa, the choice of a domain permits the identification of language resources to encode it. Though this understanding is idealistic in the absolute, it holds true to a reliable extent. Therefore, it should be highly feasible to identify both a semantic frame and a given domain. A ‘simultaneous’ point of departure then enables simultaneous research (a) on the language resources, and (b) on the domain specifics.

As mentioned above, the main problem with a language approach initially departing from a set of linguistic artefacts is the lack of a language-neutral perspective onto its corresponding domain; whilst the main problem in departing from a reality domain is the potential disparity of linguistic resources to be gathered and examined. It therefore appears that approaching linguistic relativity with an initial endeavour to identify a cohesive linguistic frame and an objective

domain of experience *in combination* should remedy these two main problems in those approaches positing the analytical independence of the two variables – language and reality – therefore advocating a linear epistemology proceeding step-by-step from one variable to another, and thus failing to anticipate or prevent irrevocable difficulties stemming in later investigatory stages.

The combined approach, however, has inherent difficulties as the precise mapping of a cohesive linguistic frame in one language onto a domain of reality may be (i) uneven within that one language, e.g. distributed over linguistic categories, (ii) only partially representing that domain schematic structure – posing linguacentric challenges, or (iii) not comparable in straightforward ways to the linguistic frame for the said domain in another language.

Remedying these issues may narrow the possibilities (e.g. domains) for investigation. However, by doing so, we may be able to select a few domains and linguistic frames most likely to be successful templates for investigating linguistic relativity. In other words, the combined approach remains empirically fruitful for the definition of valid topics of study. The crucial element in this approach then resides in the initial consideration of combining language and domain specificities comparatively. In short, the epistemological difficulty resides in the very first steps of study, rather than in later stages of research once the project is already under way. Furthermore, the difficulty is then one of topic identification, rather than one of empirical validation.

3.3. SUMMARY

This chapter has attempted to provide a coherent understanding of how to study language in the mind. It has identified modern cognitive science as the framework most likely to accommodate relativistic ideas concerning language and cognition. A brief review of the essentials in this framework has highlighted a number of notions crucial to the argumentative layout of modern relativity. These notions include the interconnectedness of language and general cognitive processes. Cognitive interdependence is a *sine-qua-non* for the possibility of influences between language-specific processes and general cognitive processes. Its stand further brings relativity into scientific realms, where cognition and language may be readily observed and tested.

More specifically, this chapter has discussed the modern understanding of language and concepts as adopted by cognitive linguists. Akin to Whorfian tenets, they claim language to be a psychological phenomenon, whose study aims to characterise meaning-making processes – what has been termed the mapping of CRs onto SRs. With semantics at the core of its linguistic inquiries, this position is essentially functionalist, identifying all language devices – including

grammar – as semantically motivated. Importantly, this thesis adopts an understanding of SRs as distinct from concepts. This will be fundamental to the relativistic arguments in the following chapters. Indeed, it has been argued that meanings are partial representations of CRs. This is crucial because relativity aims to claim and demonstrate that conceptualisation differs across speakers *because of* this partial referentiality.

Building on this understanding and on the cognitive linguistic definition of language forms representing cognitive functions and defining reality construals, this chapter has elaborated a series of methodological and epistemological approaches to the empirical study of language influences on conceptualisation. The second section has relied on Lucy (e.g. 1992a, 1997b) to identify fundamental steps and issues in addressing the linguistic relativity hypothesis. Methodological points, including the need for subjects, non-linguistic performance assessments, stimuli design, comparability, and overall validity, will be reviewed systematically in the remainder of this thesis. Epistemological approaches, as derived from the three relativistic variables – language, cognition, reality – have been further elaborated to suggest as many possible ways as one can imagine to investigate relativity. This discussion has reviewed examples of relevant studies, and has concluded by offering the possibility of combining approaches to maximise scientific outcomes. Such an epistemological combination will be further illustrated in Part III, when investigating the domain of motion and its expression at the sentence and lexical levels in French and English. Prior to this illustration, Part II aims to introduce studies that have addressed the domain of motion cross-linguistically with relativistic purposes. A critical appreciation of this research review will highlight the need to refine our understanding both of motion as a non-linguistic domain of reality, and of motion expression in language.

PART 2. MOTION

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CHAPTER 4. REVIEW OF RELATED RESEARCH ON MOTION

This chapter introduces modern relativistic research on the domain of motion. Motion is understood as the displacement of an agent or entity through space. Its four basic components include (i) a ‘FIGURE’ undergoing motion, (ii) a ‘GROUND’ or spatial reference, (iii) a ‘PATH’ or direction of motion, and (iv) a ‘MANNER’ of displacement – with PATH as the defining schema of motion (Aske 1989, Talmy 1991) (see Chapter 5 for further analysis). Linguistically, it has been claimed that this domain follows a dual pattern of lexicalisation (e.g. Talmy 1985). Therefore, the world’s languages appear to be divided into two categories depending on which of the four elements above undergo systematic expression in language. According to Talmy (e.g. *ibid.*), a language may conflate the PATH of motion either in the main verb – i.e. ‘verb-framed’ languages – or in a satellite element, such as a verb particle – i.e. ‘satellite-framed’ languages (see section 5.1.2.1.).¹ PATHS, FIGURES, and GROUNDS are elements typically receiving systematic expression in language. MANNER, on the other hand, is encoded either within an optional constituent, e.g. gerunds, in verb-framed patterns, or in the main verb of the sentence in satellite languages. In other words, MANNER is overtly marked in satellite languages (e.g. Germanic), and covertly marked in verb-framed languages (e.g. Romance).

The relativistic question addressed in motion research is thus whether the selective lexicalisation of MANNER entails differential levels of cognitive salience of that variable across verb- and satellite-framed language speakers, resulting in overall divergent conceptualisation of motion events.

The domain of motion has been particularly attractive since the formalisation of its typological dynamics in the 1980s – mainly through Talmy’s work (e.g. 1985, 1991, 2000). Furthermore, this domain is highly interesting because it corresponds to a natural domain (see section 3.2.2.2.) which is experienced, conceptualised, and expressed by all members of the species. At the same time, this domain is sufficiently complex not to be subject to biological physio-motor determinism:

The domain of motion is an ideal arena for the Whorf hypothesis – in ways in which the colour domain was not – because there are no biologically-determined concepts here waiting to be labelled (Slobin 2000: 122).

¹ According to Talmy (1991: 486), verb-framed languages include “Romance, Semitic, Japanese, Tamil, Polynesian, most Bantu, most Mayan, Nez Perce, and Caddo”; and satellite-framed languages include “most Indo-European minus Romance, Finno-Ugric, Chinese, Ojibwa, and Warlpiri.”

This complexity ensues (a) from the several components animating its dynamics, e.g. FIGURE, GROUND, PATH, MANNER (see section 5.1.1. for further schemas); and (b) from the contextualisation of MOTION within larger events involving objective as well as subjective states, e.g. goals, causes, motion sequences, consequences, symbolisms. In other words, motion conceptualisation is not a simple matter of visuo-motor processing, arguably the same for all members of the species. As Talmy (1988: 171) explains, motion events do not correspond to

Euclidean-geometric concepts – e.g. fixed distance, size, contour, and angle – as well as quantified measure, and various particularities of a quantity: in sum, characteristics that are absolute or fixed.

In short, unlike more basic natural domains such as COLOUR, RATE, SHAPE, MATERIAL, and so on (ibid.), MOTION is typically not conceptualised as a – possibly arbitrary – agent or event property, but as an integral event itself with meaningful purport. Given the quantitative and qualitative complexity of even the simplest of motion events, their processing is of an order complex enough to cause selective attention to some of its components rather than others. Furthermore, due to their typical contextualisation within larger life situations, the cognitive conceptualisation of motion events may also depend on that situational context, e.g. agent goals, emotions.

This schematic complexity is reflected in the language resources and patterns used in natural languages to communicate motion events. Indeed, this domain is not restricted to isolated lexical items in its expression, but instead reaches to the sentence level, involving grammatical relations with dynamic semantic import. In short, Talmy's typological work has made the domain amenable to linguistic characterisation, whilst the above considerations satisfy the basic considerations for productive investigations into linguistic relativity (as addressed in section 3.2.).

This chapter reviews but a sample of the body of research now available on the topic of motion in relativity. It starts with Slobin's famous empirical efforts and innovative notion of *Thinking for Speaking* (e.g. 1987, 1991, 1996a). Slobin's work is a useful starting point as it sparked off most empirical studies on the subject, by suggesting methods and stimuli for addressing motion in language and cognition. Slobin's research remains nonetheless a reformulation of Whorfian tenets, and does not fully address the crucial question of cognitive implications deriving from lexical divergences. This question was investigated more explicitly by Papafragou et al. (2002) and Gennari et al. (2002), which may be considered some of the very first studies to address motion from a truly Whorfian perspective. These two studies,

together with yet more recent ones (e.g. Bohnemeyer et al. 2004, Zlatev & David 2003, 2004) are fully reviewed and critically appreciated later in this chapter.

4.1. SLOBIN'S *THINKING FOR SPEAKING* RESEARCH

Slobin (e.g. 1996a & b, 1997, 2000, 2002) used the domain of motion event linguistic typologies to suggest a somewhat weaker version of linguistic relativity, compared to that espoused by Whorf and Lucy. In this new approach, Slobin (1996a: 76) did not propose to examine “whatever effects grammar may or may not have outside of the act of speaking,” i.e. non-linguistic thought; but, rather, he offered a new approach whereby

the expression of experience in linguistic terms constitutes **thinking for speaking** – a special form of thought that is mobilised for communication (ibid.).

His intention was thus to examine *linguistic* cognition. Despite the fact that the present research is not investigating linguistic cognition, but instead focuses on cognitive implications deriving from language, Slobin's research is reviewed critically here with the ultimate aim of adapting his methods to suit the experimental purposes of the present thesis.

4.1.1. A NEO-WHORFIAN PROPOSAL

Slobin initially looked at the study of language and thought from the angle of language acquisition. In children he expected to find the source of their relationship and to be able to observe its development. However, Slobin is sceptical about the validity of a dynamic relationship existing between two “static entities,” i.e. language and thought. In his reformulation of linguistic relativity, he replaced these static entities with the dynamic activities of “thinking and speaking” (ibid.: 71), positing that

there is a special kind of thinking that is intimately tied to language – namely, the thinking that is carried out, on-line, in the process of speaking (ibid.: 75).

The ‘kind of thinking’ Slobin referred to concerns the specific reality aspects (including linguistic ones) that speakers must attend to whilst using communicative devices to express their thoughts about that reality, and thus paying more attention to certain features of the experience which they intend to express in language. In Slobin's words, patterns of thinking for speaking describe

the online organisation of the flow of information and attention to the particular details that receive linguistic expression (ibid.: 78).

These patterns further result in what Slobin labelled the construction of a “verbalised event:”

The world does not present ‘events’ and ‘situations’ to be encoded in language. Rather, experiences are filtered through language into verbalised events. A ‘verbalised event’ is constructed on-line, in the process of speaking (ibid.: 75).²

In this construction, Slobin noticed that “languages incline towards different patterns in what is asserted and what is implied” (ibid.: 84). Reminiscent of Whorf, Slobin thus focused on categorial obligatoriness and optionality in linguistic expression, implying as Roman Jakobson had once stressed that

the true difference between languages is not in what may or may not be expressed but in what must or must not be conveyed by the speakers (1959: 142).

To strengthen his argument, Slobin mentions the phenomenon of first language interference in second language acquisition, what he labelled (1996a: 89) “first-language thinking in second-language speaking.” The idea suggests that the main obstacle to learning a second language successfully stems from the fact that speakers already have a way of speaking and thinking about sensible experience. Hence, because speakers already hold a specific way of attending to certain features of experience rather than others for the purpose of linguistic expression, the conceptual re-structuration of those features involved in learning a new language meets resistance, in that it poses an almost ontological challenge to the learner. Indeed, learning a new language demands that the learner re-organises the mapping of conceptual elements onto semantic forms of a linguistic nature. This re-setting of conceptual structure results in first language interference (ibid.: 89-90).

These points led Slobin to discuss the relativistic idea of worldview, as generated by the reality construals afforded by our symbolic and natural environments:

The language or languages that we learn in childhood are not neutral coding systems of an objective reality. Rather, each one is a subjective orientation to the world of human experience (ibid.: 91).

Despite his explicit discussion of linguistic relativity, together with its implications at the individual and collective levels of cognition, Slobin’s *Thinking for Speaking* hypothesis does not address relativity à la Whorf. Instead, Slobin proposes to examine how the act of using language necessitates directing one’s attention to particular aspects of experience, whose lexicalisation is required by the native language. This proposal seems uncontroversial overall – so uncontroversial, in fact, that an anti-Whorfian such as Pinker takes it as a given:

² Slobin interestingly echoes Whorf’s phrasing (1956: 212-3): “Formulation of ideas is not an independent process, strictly rational in the old sense, but is part of a particular grammar, and differs, from slightly to greatly, between different grammars. We dissect nature along the lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organised by our minds.”

one's language does determine how one must conceptualise reality when one has to talk about it (Pinker 1989: 360).

As such, Slobin's re-formulation of linguistic relativity is somewhat limited in the type and scope of thinking it refers to, and constitutes an ambiguous re-interpretation of the Whorfian postulate, given the alleged interconnectedness between language and general cognitive processes. Indeed, understood in connectionist terms, *Thinking for Speaking* would imply language influences on general cognition. The difference between Slobin's postulate and Whorf's resides in the temporality and pervasiveness of those influences. According to Slobin, language effects are 'on-line' and occur whilst processing language – this is akin to psycholinguistic interferences; whereas, according to Whorf, effects are pervasive, and are thus present unconsciously at all times – whether processing language or not – hence generating conceptual structures of reality and overall worldviews.

4.1.2. EMPIRICAL STUDIES

To investigate the idea of *Thinking for Speaking*, Slobin (e.g. 1996a & b, 1997, 2000) explored the domain of motion in space, as mentioned above. His approach was comparative, initially investigating English and Spanish (Slobin 1996b), as the two languages contrast in their lexicalisation of motion events, with English corresponding to Talmy's satellite-framed languages, and Spanish to verb-framed languages. In follow-up studies, Slobin broadened the language pool to include German and Hebrew (1996a), and Dutch, Icelandic, Swedish, Polish, Serbo-Croatian, Russian, French, Italian, and Portuguese (1997).

Slobin concentrated on collecting linguistic data of a discursive nature. For this purpose, he used corpus data from 20th-century literary novels (e.g. 1996b), and translations of *The Hobbit* by Tolkien (Slobin 1997). Slobin also consistently elicited spoken narratives from native speakers of the above languages. To this end, he used a non-linguistic stimulus, namely a series of 24 drawings in a sequence from the now-famous Frog stories (Mayer 1969). This short book is an ideal non-linguistic stimulus as none of the pages contains any language. In short, the stimulus is visual only, and therefore no language interference is to be expected. The book is famous for depicting several motion scenes, involving several types of FIGURE (i.e. human and animal), PATH (e.g. UP, DOWN, THROUGH), and MANNER (e.g. RUNNING, CLIMBING, STUMBLING). The set of drawings eventually amounts to a cohesive story about a boy and his wanderings through the woods to find his lost pet frog.

Slobin proceeded by asking native speakers of each language type to verbally describe the motion scenes in the picture book. In the majority of his studies, the subjects included both adults and children, with pre-schoolers (from age 3 to 5), school children (age 9), and adults.

Using a minimum of ten narrators per age group and per language, Slobin gathered considerable numbers of narratives depicting motion events. Whether drawn from corpus or naturalistic resources, the data is thus linguistic.

Slobin's a priori *Thinking for Speaking* hypothesis (1996a: 76) was essentially that in acquiring a native language, the child learns particular ways of thinking for speaking.

Slobin paid special attention to spatial and temporal expressions, e.g. prepositions, verbs, tenses, modes, and aspect. Overall, his findings report that verb-framed languages express the notion of PATH more consistently than the notion of MANNER when describing motion scenes; whereas satellite-framed languages express both notions. Further, PATH information in verb languages indicates endpoints of trajectories more consistently than in satellite languages. The latter languages emphasise the continuity of PATHS, in combination with fine-grained specificity of MANNER types. Verb languages, on the other hand, appear to have comparatively small MANNER verb lexicons, and express MANNER on an ad hoc basis only, when it is deemed particularly relevant to the context. Such semantic additions, however, render sentences heavier. Slobin concludes that each language type engenders particular fashions of speaking about motion events, so that in English, for instance, actions are asserted and results are implied, whereas in Spanish, results are asserted and actions implied (ibid.: 84). This is supported by the English language data which typically relates processes, whereas the Spanish data tends to relate states (ibid.: 85). Indeed, as Slobin (ibid.: 88) explains,

there is nothing in the pictures themselves that leads English speakers to verbally express whether an event is in progress, or Spanish speakers to note whether it has been completed; to encourage Germanic speakers to formulate elaborate descriptions of trajectories; to make Hebrew speakers indifferent to conceiving of events as durative or bounded in time.

The *Thinking for Speaking* hypothesis is seemingly confirmed by these results to the extent that, as early as 3 years of age, children have become sensitive to grammatical distinctions in communicating non-linguistic events that ought to be similar to all members of the species (ibid.: 77):

even pre-schoolers give evidence of language-specific patterns of thinking for speaking.

One difficulty with this research, however, is that Slobin's aims are somewhat ambiguous. For example, Slobin (ibid.: 75) claims to seek

to demonstrate that, by the age of three or four, children acquiring different types of languages are influenced by such [grammatical] categories in verbalising events.

Here, the purpose is clearly to investigate the influence of grammatical patterns on children's linguistic encoding of events – not on their *thinking*. Yet, in the same paper (ibid.: 76), it appears that the

major concern is with the possible cognitive effects of linguistic diversity in the course of child language development.

Admittedly, the proposed method of investigation is to

ask children in different countries to tell stories about the same sequence of pictures and see if their stories differ consistently, depending on the language they are speaking (ibid.: 76-7).

This methodology satisfies the initial statement of research aims, but not the one seeking to explore thinking – albeit thinking for speaking. The reason for this shortcoming is that cognitive effects of linguistic diversity can only be studied by examining cognitive performance. Consequently, the conclusions reached remain ambiguous (ibid.: 91):

The language or languages that we learn in childhood are not neutral coding systems of an objective reality. Rather, each one is a subjective orientation to the world of human experience, and this orientation **affects the ways in which we think while we are speaking**.

No cognitive evidence has been provided to document those 'ways in which we think' (c.f. Lucy 1992a).

4.1.3. EVALUATION OF THE PROPOSAL

Although Slobin's research is insightful and may be seen to contribute to the advancement of linguistic relativity, it does not explicitly show whether and how language, or *speaking*, affects cognition, or *thinking*. Rather, it shows how speakers are predisposed to attend to certain aspects of experience due to grammatical artefacts. In this sense, it does not prove any cognitive implication resulting from the use of language. Rather, it points to correlates between grammar and thought. Yet even this much is unconvincing as there may be

nothing in the pictures themselves that leads English speakers to verbally express whether an event is in progress. (Slobin 1996a: 88)

Yet there definitely *is* something in the language speakers use that leads them to verbally express that an event is, for instance, in progress. This something consists precisely of the lexicalisation patterns mentioned above, which speakers *must* follow if they are to use language in order to communicate successfully. This does not prove that speakers of different languages are either more sensitive or pay more attention to certain aspects of the same reality than to other aspects. A similar assessment is offered by Gennari et al. (2002: 55):

In Slobin's studies, each response pattern observed was mediated by language, i.e. it constitutes linguistic rather than non-linguistic evidence. Speakers speak the way they do precisely because of the lexical restrictions characteristic of each language; it is largely pre-determined that English speakers will express more MANNER distinctions than Spanish speakers... Different verbal descriptions by speakers of different languages need not imply different cognitive or conceptual representations at the non-linguistic level. Slobin's evidence does not directly speak to the question of whether English and Spanish speakers conceptualise events differently.

From a relativistic viewpoint, Slobin's research lacks sound empirical evidence, and relies too much on intuitive speculation and deductions from correlations. As Papafragou et al. (2002: 196-7) comment,

it is often a short hop from noticing that linguistic usage differs cross-linguistically to drawing non-linguistic implications.

Indeed, though Slobin's argument is partly supported by empirical evidence, it largely remains intuitive:

I am convinced that the events of this little picture book are experienced differently by speakers of different languages (Slobin 1996a: 88, emphasis added).

In comparison with S-language narratives, the Spanish texts have an abundance of such static descriptions of settings, *suggesting* a different allocation of attention between description of movement and description of states (Slobin 1997: 450-1, emphasis added).

The difficulty with Slobin's study stems from his departing from a non-linguistic stimulus to arrive at a linguistic result – which was predictable – and from there suggesting non-linguistic patterns of habitual thinking. In short, the argument is circular, so far as documenting thinking is concerned. Overall, what Slobin has demonstrated is that speakers have to think about language itself in order to speak. This thinking becomes systematised to a certain degree in the process of language acquisition and use, and varies cross-linguistically according to specific grammars. In sum, Slobin has only shown *how* a specific language asks its users to highlight PATH or MANNER according to their native input. This does not, by any means, posit any cognitive consequences, and as such, does not provide any evidence for linguistic relativity. If the relativist's purpose is indeed to show that different languages engender different ways of thinking, then their likely evidence ought to consist of those very ways of thinking. Observing linguistic behaviour merely helps document linguistic diversity, not cognitive divergences.

Slobin (2000) elaborates further on his 'dynamic approach to linguistic relativity' by examining mainly linguistic data drawn from picture-elicited oral narratives, creative fiction, translation, spontaneous conversation, parent-child discourse, text-elicited imagery recollections, and gestures accompanying speech. In his comparative examination of motion events in satellite- versus verb-framed languages, he concludes that

the considerable range of evidence examined here is at least *suggestive* of rather divergent mental worlds of speakers of the two language types (ibid.: 133, emphasis added).

Yet, note again that the evidence revolves around linguistic data, and hence, from the present perspective, the argument remains circular to a large extent, i.e. it assumes that linguistic differences lead to variation in cognitive perceptions and concludes therefore that such variation results from linguistic differences. Overall, Slobin's conclusions about putative variations among speakers of different languages are solely language-based and, hence, from a psychological perspective, can only be regarded as unsubstantiated and ambiguous. As Gruber & Segalowitz (1977: 11) remind us here:

There is a persistent temptation in an interdisciplinary field to interpret correlations as explanations... Not only does this underrate the power of psychological models, it leads the investigator to erroneous conclusions.

4.1.4. LANGUAGE & THOUGHT ONLINE: COGNITIVE CONSEQUENCES OF LINGUISTIC RELATIVITY

Slobin (2002) attempts to remedy these shortcomings by addressing more explicitly the question of cognitive processes and the hypothesis of linguistic relativity:

research on linguistic relativity is incomplete without attention to the cognitive processes that are brought to bear, *online*, in the course of using language (ibid.: 158).

In this extensive paper, Slobin posits a number of cognitive hypotheses:

I hypothesise a set of *cognitive consequences* of differential encoding of manner of motion: If a language provides fine-grained, habitual, and economical expression of manner of motion:

- References to manner of motion will occur frequently, across genres and discourse contexts.
- Manner-of-motion verbs will be acquired early.
- The language will have continuing lexical innovation in this domain, including extended and metaphorical uses.
- Speakers will have rich mental imagery of manner of motion.
- Manner of motion will be salient in memory for events and in verbal accounts of events.

In brief, the proposal is that habitual, online attention to manner has made it especially salient in S-language speakers' *conceptualisations* of motion events (ibid.: 163-4, emphasis added).

Note that only the last two hypotheses are truly cognitive. The first three are similar to the proposals made in previous *Thinking for Speaking* research, making linguistic predictions concerning lexical resources, codability, and language acquisition. The process of conceptualising is itself cognitive – though it may be mediated by linguistic input – and thus requires cognitive data for documentation, e.g. imagery, memory.

Slobin proceeds with an extensive review of data drawn from diverse languages. These include one-minute-long elicitations of MANNER verbs with English and French native speakers, two-hour-long conversations from Spanish, Turkish, and English, oral narratives elicited from the frog stories, written narratives, e.g. novels and translations, child language (using the CHILDES database), and lexical innovations recorded in Old English. Though the above constitute a substantial body of data, the resources and responses drawn are all of a linguistic nature. As mentioned above, these types of data do not document cognitive consequences of language use or speakers' conceptualisations of events. Instead, they document linguistic resources and their ready codability in actual usage, together with discursive patterns of expression.

Slobin also presents some novel data to address the question of mental imagery. For this purpose, he analyses newspaper reports of international events in several languages, expecting that for speakers of satellite languages, the

mental imagery for described events – in comparison with users of V-languages – contains more information about manners of movement and change of state (ibid.: 172).

This research, however, consists of the semantic analyses of textual data. It is still noteworthy, however, to mention that in this case, Slobin sought introspective impressions from native speakers – though these may be considered weak data in support of Slobin's conclusions:

Suggestive evidence for this proposal comes from reading accounts of the same event in newspapers written in different languages... it is my impression that events reported in English and Dutch seem to be more active, dynamic, or violent than reports of the same events in French, Spanish, or Turkish. These impressions have been confirmed by native speakers of those languages (ibid., emphasis added).

More convincingly, Slobin innovated an approach whereby subjects were asked to recollect and re-tell a written narrative translated literally from Spanish, therefore containing no MANNER verbs, but ground and agent details instead, making MANNER inferences possible. Specifically, Slobin asked English and Spanish subjects to recall the MANNERS of motion in the story. His findings report accounts of vivid and elaborate mental images for MANNER in English speakers, as opposed to poor imagery recall by Spanish speakers. Interestingly, the study also used bilinguals, who responded either in terms of vivid or of poor imagery for MANNER depending on whether they were tested in English or Spanish respectively. These findings are more suggestive of language effects on cognition in terms of the nature of the evidence brought to address speakers' conceptualisation of motion events. However, the validity of introspective statements requires further testing for its full validation. This testing crucially needs to involve non-linguistic stimuli, so as not to probe responses via semantic interference, and non-linguistic

performance by subjects, so as to assess the extent of the pervasiveness of fashions of speaking on fashions of thinking.

4.1.5. SUMMARY

Slobin's research provides invaluable insights into the cross-linguistic differences for encoding the domain of motion, including child and adult output. The variety of data considered brings together language patterns as used across several modalities, e.g. writing, speaking, translating (see also Slobin & Hoiting 1994 for signing). Crucially, Slobin's research has emphasised the need to document fashions of speaking as commonly used by speakers in their daily encounters – a requirement also stressed by Whorf. This requirement necessitates time-consuming data collection and analyses, beyond sentence-level typologies and computerised corpora. Most importantly, it documents the habitual ways of expression used by a community. These habitual ways of speaking are the basis for further possible speculations about habitual ways of thinking and conceptualising. This documentation constitutes Slobin's main contribution to the research field on motion linguistics.

However, with regard to linguistic relativity, Slobin's data is not adequate enough to tackle the hypothesis at hand – including that of *Thinking for Speaking*. Too little cognitive data is evaluated, and the introspective nature of the mental imagery experiments remains too suggestive to posit any preliminary conclusions on the relationship between language and cognition with reference to the domain of motion. As Slobin admits:

Most of the data presented in this chapter rely on an inferential argument: speakers of typologically different languages vary in their linguistic construals of events, across a wide range of situations of language use. There seem to be quite clear differences in habitual ways of talking about the sorts of events that all human beings experience and care about. More elusive have been clear demonstrations that these sorts of online attention may also have long-term and pervasive effects on mental representation and conceptual processes (Slobin 2002: 179).

4.2. PAPAFRAGOU, MASSEY & GLEITMAN (2002)

This study, along with the study in the following sub-section, is closer to the type of relativistic research undertaken in the third part of this thesis, and is, likewise, originally inspired from Slobin's and Talmy's innovative observations and ideas. Both studies address the same question as the present research, i.e. whether linguistic patterns have any influence on non-linguistic behaviour.

Papafragou et al.'s (2002) study looks at two types of non-linguistic behaviour, namely memory and categorisation, across Greek and English speakers whose languages follow

different motion event lexicalisation patterns – Greek being verb-framed and English satellite-framed. Further, this study seeks to investigate whether linguistic patterns and cognitive performance differ between children and adults of the same language, thus addressing the developmental interest already present in Slobin's work.

4.2.1. HYPOTHESES

Papafragou et al. (2002) address three sets of questions and related hypotheses, corresponding to linguistic, cognitive, and developmental issues. This study adopts a typical language approach, and thus departs from the examination of language differences in encoding motion. Their first hypothesis seeks to question and confirm the differences in lexicalisation patterns reported by Talmy (e.g. 1985), identifying Greek as a verb language and English as a satellite language. Upon this initial consideration of the language aspects, Papafragou et al. (2002) elaborate a cognitive hypothesis for language influences on cognition, which they later proceed to test:

Memory and/ or categorisation performance for motion depictions will vary for speakers of the two languages (ibid.: 198).

Paralleling these epistemological stages, the study examines age as a variable, hence further assessing these two initial hypotheses with respects to language and cognitive development. These acquisition concerns give rise to a third set of hypotheses: (i) linguistically, adults are hypothesised to display greater divergence in their adherence to distinct lexicalisation patterns for motion encoding, and (2) cognitively, this should be mirrored by language effects progressively increasing as children age.

With regard to cognitive performance and relativistic hypotheses, Papafragou et al. voice two main predictions. First, one may consider that the lexical verb is the central element in the sentence and therefore in memory too, so that English speakers would find MANNER more salient than PATH of motion, whereas Greek speakers would be more sensitive to PATH information. Second, one may, by contrast, consider that verbal information is backgrounded and that the semantic elements expressed in other constituents in a sentence are therefore more emphasised and more salient in speakers' minds, i.e. semantic salience à la Talmy (1985: 122):

Other things being equal (such as a constituent's degree of stress or its position in the sentence), a semantic element is backgrounded by expression in the main verb root or in any closed-class element (including a satellite – hence, anywhere in the verb complex). Elsewhere it is foregrounded.

According to this second set of predictions, Greek speakers would find MANNER information more salient. Here, the authors hypothesise that English speakers would be more sensitive to PATH information because

the path is exhibited independently (“foregrounded”) on the surface of the motion verb sentence in manner-verb languages rather than being hidden and wrapped up inside the meaning of the verb (Papafragou et al. 2002: 198).

However, such a prediction may be erroneous, as it ignores the fact that a satellite (i.e. the surface element typically expressing PATH in English) is part of the verb complex, and thus should be considered as being “wrapped up inside the meaning of the verb.” Indeed, according to Talmy (1985: 122-3), a satellite constitutes backgrounded information, so that no prediction of differential salience can be formulated for English speakers’ performance, following this second hypothetical position. Likewise, the first prediction assumes that the verb alone, rather than the whole verb phrase (henceforth VP), is most central. This assumption is unfounded, yet critical in the case of English where PATH typically figures in the VP but not always in the lexical verb. If we follow Talmy (1985), we must take into account the whole verb complex – or VP – and it is thus not clear which surface element expresses the most salient concept of a motion event between the verb and the satellite – in satellite-framed languages.

Furthermore, as suggested above, Aske (1989) and Talmy (1991) claim that PATH information is most semantically central in a motion event, which entails that ignoring PATH information may lead to erroneous conclusions. All in all, it seems that the authors cannot afford to formulate any predictions for the English sample of responses to be obtained. Ultimately, the Greek sample of responses is the one likely to confirm whether the first or the second prediction is correct, as the Greek VP does not include both PATH and MANNER information, but only PATH information, whilst MANNER information is usually foregrounded in optional constituents. If language has any influence on non-linguistic cognitive performance, one may then expect the verb-framed language group to display greater cognitive salience patterns for PATH in the case of the first hypothesis, or for MANNER in the case of the second hypothesis.

4.2.2. TASKS

To assess these working hypotheses, this study used similar visual materials to Slobin (e.g. 1996a) consisting of static images. The study was implemented with monolingual children and adult native speakers of each language type. Most subjects performed three tasks. The first task was linguistic, and consisted of describing six drawn pictures of motion scenes. This task therefore aimed to address the first hypothesis mentioned above. Speakers were categorised in three age groups, (a) young children aged 4-7 (N=38), (b) children in school aged 9-13 (N=39), and (c) adults aged 18-50 (N=20).

The second task required the subjects to recognise the six scenes two days later against a new series of pictured motion scenes. This recognition task thus aimed to assess the relativistic hypothesis on the cognitive function of memory.

Most subjects then performed a third task, immediately following the recognition exercise. Subjects included 22 Greek eight-year-olds, 21 Greek adults, 14 English eight-year-olds, and 20 English adults. This task consisted of similarity judgements on eight triads of photographed motion scenes. Subjects were asked to select the two scenes displaying the same motion. This triad task thus aimed to assess the relativistic hypothesis on the cognitive function of category formation.

4.3.3. RESULTS

Overall, no difference was found between the linguistic descriptions provided by adults and children in either language group. This is concordant with Slobin's (e.g. 1996a: 77) observations that even young children abide by the typological patterns found in their native language to describe motion scenes.

In the memory test, language was not found to have any effect on speakers' ability to recognise whether the new scenes were the same or whether they differed from the original scenes. This invariability held true for both language groups. However, age was found to have an effect on correct recollection of scenes where MANNER was altered (but not where PATH was altered). Indeed, the younger age group failed to recognise such changes with equal accuracy as the older groups. However, this much should be unsurprising, given the memory limitations of average five-year-olds, as compared to older children and adults – especially when considering that the recognition task proceeded two days after initial visualisation, i.e. a considerably long time for the younger age group. Overall, nonetheless, no correlation was found in either language group between the linguistic descriptions provided in the first task and the recognition of PATH or MANNER changes in the second task. In sum, the results on the memory test are not supportive of the idea that language may influence non-linguistic thought.

In the review of this experimental task, a few points are, however, worth considering. First, two stimulus pictures were discarded in the data analysis (Papafragou et al. 2002: 200), hence the statistical analysis relies solely on the recognition of four pictures – a very low number of items under consideration indeed, as admitted by the researchers themselves (ibid.: 206). Further, the pictures were adapted from the Frog stories, and thus present two characters consistently, i.e. a boy and his frog. Upon viewing those isolated pictures with the same figures, it is arguably possible that subjects may infer or elaborate connected representations of the

images. That is, subjects may have construed some fragmented story around the frog-and-boy theme displayed on each picture. Cognitively speaking, it is highly likely that such representational construals may impact on memorisation, making the process possibly more inferential in nature. To make this point clearer, consider the six pictures:

- (1) A frog is jumping into a room.
- (2) A boy is swinging from a rope.
- (3) A boy is climbing up a tree.
- (4) A boy is jumping over a log.
- (5) A frog is hopping off a turtle.
- (6) A boy is diving off a cliff.

I would argue that, to both child and adult cognition, these pictures call forth vivid imagery of a child's adventures. That is, the stimuli do not depict isolated trivial human motion scenes of an everyday nature, e.g. a drawing of an adult jogging up a street, or pushing a trolley across a supermarket car park. Given this consideration together with the low number and the simplicity³ of the pictorial representations, it seems difficult to justify an adult or a child mistakenly recollecting the child as stumbling over the log, or as tumbling off the cliff, as shown in the alternate pictures in the recognition task (*ibid.*: 202). Either the quantity or the quality of the pictures – or both – should be reconsidered to obtain more indicative patterns of dimensional memorisation for motion.

In the categorisation task, it was found that both language groups performed similarly, selecting either MANNER or PATH as the association variable half of the time. This mixed performance did not appear to correlate with the lexicalisation typology for motion of either language. In other words, the categorisation task was not conclusive, in that it did not support any of the predictions highlighted above with regards the cognitive hypothesis.

Again, some reservations may be expressed with this experiment. Firstly, the stimuli consisted of static pictures. The authors tried to render this staticity more 'dynamic' by using sets of three photographs in a sequence. However, though PATH may be expressed by sequentiality, MANNER remains ambiguous on pictures. This is particularly true of the triads which contrasted e.g. RUNNING and WALKING, SNEAKING and WALKING, JUMPING and FALLING. The MANNER distinction is clearer in triads contrasting DRIVING and WALKING, as the former MANNER type requires a vehicle for implementation; however, only one such triad made the

³ Note that Papafragou et al. (see 2002: 199) asked an artist to re-draw the frog illustrations "to simplify the scenes."

distinction unambiguous. Although ambiguity is present in the stimuli, it may be argued, nonetheless, that both Greek and English have lexical resources for the encoding of such basic MANNER types. As Slobin (e.g. 2002) has thoroughly documented, both language types have MANNER verbs; the difference lies in the semantic fine-graining of MANNERS, e.g. types of WALKING, RUNNING, JUMPING, etc. That is, verb-framed languages have verbs translating *running*, *walking*, and other basic MANNERS of motion. In other words, it is unclear how Greek subjects may fail to categorise in terms of MANNER when the contrast is presented on such distinct and basic types (see section 7.2. for further discussion). In addition, the triads presented continuous and boundary-crossing PATH types. This consideration is more fully reviewed in Chapters 5 and 7. At this stage, it is enough to say that CONTINUOUS PATH types emphasise the processual property of a motion event, and hence target attention at MANNER details; whereas BOUNDARY-CROSSING PATHS emphasise the resultative property of a motion event, and hence direct attention to PATH ENDPOINTS. Considering the equal distribution of both types, it may not be entirely surprising that responses were distributed equally over MANNER and PATH categorisation. An item analysis of the responses obtained in the study is not provided by the authors to contemplate these possibilities.

In sum, Papafragou et al. (2002) claim that neither test offers support to the idea of linguistic relativity in the domain of motion. To conclude, the authors suggest that

while any particular language is a partial vehicle for representing thought, its limitations and exactitudes do not impose themselves on the representation of experience (ibid.: 214).

They suggest that those results are particularly telling as the subjects in the memory experiment were asked to provide explicit linguistic descriptions of the stimuli, so that one would expect an even stronger influence of language on non-linguistic performance (see e.g. Tyler & Spivey, 2001). However, the descriptions preceded the task by 48 hours, which may be considered to be a significant amount of time. Furthermore, it is an uncontroversial psycholinguistic fact that speakers do not retain surface representations of linguistic forms. These are not held long in working memory. Instead, speakers build semantic or situational representations of discourse for effective long-term memorisation (e.g. Kintsch 1988). As such, one would not expect language priming interference in the memory task, unless it had followed visualisation within a closer time range. It would have been particularly interesting, therefore, to prime the categorisation subjects, by splitting them into two groups, i.e. one group providing linguistic descriptions prior to the similarity judgement task, and one group performing the task directly. Papafragou et al. asked the participants for linguistic descriptions of the photographed triads *post-task*. The

cognitive objectives of this task are not altogether clear. Seemingly, some encoding effects from the categorisation task were expected:

did the way the subject categorised the sample item (as indexed by categorisation choice) predict subsequent verbal description? (Papafragou et al. 2002 : 209).

Besides the fact that this question does not address any of the hypotheses outlined in section 4.2.1., it is difficult to conceive of its relevance overall. Indeed, if validated, it would suggest that non-linguistic conceptualisation of motion influences its expression in language. Though the idea is far from nonsensical, it would be more appropriate for event-based stimuli to be used, rather than basic photo shots with little amenability to contextual or subjective elaboration. Furthermore, these influences from non-linguistic conceptualisation are highly restricted by linguistic conventions, in that speakers must conform to the linguistic resources available in their language for communication. As such, the lexical patterns of the collected data were strongly predictable prior to the task. This exercise does not, therefore, address the question of linguistic relativity.

Finally, the authors offer a concluding comment with regard to task-on-task effects. They suggest that when language is used in a task, linguistic knowledge is more likely to be invoked to take a non-linguistic decision, so that language is used strategically because it is made an available tool through the nature of the task at hand. Conversely, it is suggested that if the design of a task does not involve language as a decision-helping tool, then subjects will display their natural perceptual and conceptual tendencies for handling the task. The response patterns then observed will tend to be similar across members of different groups, thus suggesting some universal pattern of behaviour. The logic of this argument runs counter to Whorfian tenets, which this study has failed to either support or disprove. In addition, this 'strategic' proposal remains unsubstantiated by Papafragou et al.'s findings.

4.3. GENNARI, SLOMAN, MALT & FITCH (2002)

Gennari et al. (2002) tested for the same effects as Papafragou et al. (2002) across English and Spanish speakers. Their study used adult subjects only. Two non-linguistic tasks were administered, one testing the effects of language on memory and one testing the effects of language on categorisation. However, task design, task administration and the final results differ from the above study. This seems to suggest that methodology is crucial in determining potential effects.

4.3.1. HYPOTHESES

Gennari et al. (2002) highlight the possibility of three types of predictions. Their “strong language-based view” (ibid.: 50) corresponds to the relativist stance, whereby language patterns are expected to impact on conceptualisation, whether in the act of using language or not. They also address a “weak language-based view” (ibid.: 50-1) corresponding to Slobin’s *Thinking for Speaking* conception, whereby language effects are expected online in the process of speaking and comprehending. Finally, they suggest a “language-as-strategy view” (ibid.: 51), whereby language may influence non-linguistic cognition in problem-solving tasks by being used as a computing tool. From this set of possibilities, they infer that language effects would be obtained in all types of tasks in a strong language-based view; whereas effects would only be obtained in tasks using linguistic priming in the weak language-based view; and effects may only be obtained in linguistically pre-primed tasks involving decision-making (e.g. judgement) in the strategic view.

Linguistically, Gennari et al. (2002) assume that the semantic elements highlighted in obligatory constituents – the VP in this case – are more likely to trigger heightened cognitive salience, as their corresponding conceptual representations must be attended to for effective communication. Their relativistic predictions thus suggest that Spanish speakers would be less sensitive to MANNER specificities than English speakers, and that English speakers would be equally sensitive to PATH and MANNER, as the language encodes both notions systematically. The hypotheses therefore seem pertinent, in light of Papafragou et al.’s (2002) dismissal of PATH as a salient variable in satellite languages.

4.3.2. TASKS

Gennari et al. (2002) used visual stimuli of a videoed nature to display motion scenes in dynamic three-dimensional space. This type of stimuli offers a methodological innovation of great value, as it portrays the dynamic nature of the motion domain more closely than static pictorial stimuli. As such, it is likely to yield different results from Papafragou et al.’s study, as the motion reality can no longer remain ambiguous and subject to inference. A total of 108 video clips were shown, amounting to 36 triadic sets. The quantity of the triads marks an additional methodological improvement from the previous study, as it involves greater variability of motion scenes, including MANNER and PATH types, and as it invites more responses per subject. It is possible, however, that such a high number of triads may require lengthy viewing and testing time. Such lengthy testing may impact on subjects’ performance. In addition, it may lead subjects to identify the topic of the investigation. Such identifications are

conducive to adopting problem-solving strategies at the individual level, and thus may further skew the validity of the responses obtained.

All subjects ($N_E=46$, $N_S=47$) watched all 108 films, then completed a distractor exercise, before proceeding onto the recognition task testing memory, following which they finally completed the categorisation task, i.e. similarity judgements.

The authors divided the subject pool into three equal groups – each approximating fifteen subjects – to perform the tasks under different conditions corresponding to the three types of predictions highlighted above. Under a ‘naming first’ condition, one group were asked to give linguistic descriptions of the videos before performing the memory and categorisation tasks. This first group was thus linguistically primed, and should display more emphasised response differences were the weak language-based view valid. Another group gave the linguistic descriptions after the non-linguistic tasks. This condition was thus one of ‘free encoding.’ In this case, the strong and strategic views would be expected to display cross-group differences. Indeed, cross-language group differences should occur, according to the strong view; whereas, inconsistent differences (and thus reduced significance) should obtain in the strategic case, as some subjects may use language as a computing tool selectively. Note that the weak view would predict no difference across groups – unless this view were combined with the possibility of a strategic approach (though the possibility of such cognitive combinations is not suggested by the authors). Finally, a third ‘shadow’ group was asked to utter nonsense syllables whilst watching the stimuli – the aim here being to avoid any likely linguistic processing of the visual stimuli and to overload working memory so that strategic appeal to linguistic knowledge via memory would be compromised. In this latter group, only the strong view would expect cross-group differences in response patterns.

4.3.3. RESULTS

Gennari et al. (2002) found that speakers typically followed their native language typology for depicting motion events, as predicted by the Talmyan model. All three English groups expressed MANNER to the same extent averaging 86% of description instances. However, the Spanish naming-first group who described the scenes before the other tests expressed MANNER less often (i.e. 64%) than the other two Spanish groups (i.e. 76% and 73%). This is an interesting finding confirming Slobin’s important emphasis on naturally occurring discursive patterns. Indeed, this experiment reports an important task-on-task effect, whereby visually-probed and tested subjects have come to develop an understanding of the objects of study, namely PATH and MANNER, so much so that their post-task descriptions no longer reflect more naturalistic linguistic patterns as

reported in Slobin's numerous studies, and in the naming-first subject group of this very study. It is imaginable, therefore, that task-on-task effects are obtained in the memory and categorisation results too. Indeed, in the present case, the amount and length of tasks to be performed in a sequence constitute potentially skewing variables for the validity of the responses. In addition, all tasks used the same stimuli, therefore allowing for little distraction from the focus of the investigation, i.e. motion. Further aggravating ideal naturalistic requirements, the instructions for the linguistic task were highly controlled. Consider:

Participants... were asked to use a single verb phrase that referred to the event shown as a whole, rather than using several verbs indicating different small actions... four examples were provided that suggested the general form of the desired descriptions... Since in Spanish manner adverbs are optional, participants were told that parentheses indicated optional forms, and adverbs appeared in parentheses in the examples. Three of the examples were:

1. What happens in the clip? He walks into the room.
2. What happens in the clip? He rolls the can into the box. Do NOT name all actions as in: "he rolls the can then puts it in the box."
3. What happens in the clip? He crawls in front of the table.

...Do not describe component actions as in "he first walks and then stops" or as in "he opens the door then he closes it behind him". Rather, *you should say* "he walks up to the center" or "he goes in". Think of a phrase that may be more general but refers to the totality of what happens in the clip, as if you had to tell somebody what happens in it. This may be hard to do for some clips. It requires you to take a more general perspective (ibid.: 62-3, emphasis added).

This level of control suggests that the language responses could not be truly representative of genuine patterns of motion expression, regardless of the testing condition.

Considering now the cognitive tasks, the authors report that, in the memory task, recognition performance varied as a result of the experimental format, in that the shadow condition incurred much greater inaccuracy of recall. Overall, no language effect was found to correlate with the observed behaviours across conditions, though the Spanish free-encoding group made more errors than the naming-first group. The differences between the two language groups also proved non-significant. It seems, therefore, that language had no effect on recognition memory in this experiment.

In the categorisation task, on the other hand, Spanish speakers who gave linguistic descriptions prior to the test made more PATH associations than English speakers. Indeed, in the naming-first condition, this Spanish group averaged 75% of same-PATH associations, whereas the comparative English group averaged 52% of same-PATH associations. In addition, these statistics differ across testing conditions, with Spanish free-encoders averaging only 57% of same-PATH associations, and English free-encoders yielding 65% of same-PATH associations.

These results are suggestive of strong language priming effects. As such, they provide adequate evidence in support of Slobin's *Thinking-for-Speaking* hypothesis, and of the strategic view of language, as:

The language effect occurred only when language was relevant during initial encoding (ibid.: 72).

The authors performed a correlation analysis between SR tokens and association performance. Though all three conditions are reviewed in this analysis, the naming-first condition is the only one pertinent for the present discussion. They report 70% of MANNER-and-PATH expressions correlating with a same-PATH association, as opposed to 77% of PATH-only expressions correlating with a same-PATH association. From this small difference, they conclude that the weak language view may be dismissed in favour of the less consistent strategic language view.

The authors suggested two hypotheses to explain the data. First, they proposed the possibility for an event-specific hypothesis, according to which the descriptions provided for one specific triad of scenes would bias subjects' judgements. Second, they proposed that language might have a more subversive influence, so that judgements would follow an event-general pattern, i.e. the pattern dictated by the given language typology for motion events, regardless of the specific linguistic details present in the descriptions provided by the subject. Results from the data sample suggest that the event-general option may be the correct hypothesis, given that PATH associations were made in Spanish although bare MANNER verbs were used in the descriptions. In other words, surface elements in a language do not seem to have any form of influence on non-linguistic thinking, however, deep-rooted rules of language use may bias speakers when faced with a problem-solving task such as similarity judgements. It seems, nonetheless, that such a stand may undermine the strategic conclusions posited above, and allow for Thinking-for-Speaking effects after all.

To conclude, some effects of language on non-linguistic performance were found in this study and these effects agree with Talmy's linguistic typology. These effects seemed to result from the explicit use of language prior to performing similarity judgements, and were found in both language groups. As in the previous study, the present authors conclude by dismissing strong and weak relativistic positions in favour of the idea that language and reality are dissociable, and furthermore, that whenever language is used to deal with non-linguistic tasks, it is used as a strategic tool when other alternative resources may not be available or efficient.

Such conclusions may be hasty, however, and I would suggest that a greater number of subjects (i.e. $N > 15$), and less cognitively demanding tasks would be required to confirm such conclusions. As mentioned, the testing methods were highly conducive to conditioning the

subjects into concentrating on the domain of motion. It appears that both their linguistic and cognitive behaviour were assessed in unrealistic conditions involving pressure, decontextualised conceptualisation and, overall, little room for naturalness. In such conditions, it is all the more paramount to increase the number of subjects considerably (i.e. by at least twice) in order to level out those skewing methodological factors. A further point of concern relates to the nature of the filmed stimuli. As in the previous study, they often contrasted MANNER types expressible in both languages, e.g. WALK, JUMP. In addition, they also contrasted MANNER types along absolute, rather than fine-grained, distinctions, e.g. WALK vs. HOP, as well as neutral-MANNER types, e.g. GET. Finally, some triads did not offer MANNER contrasts at all, e.g. triad (32) involved CRAWLING in all three films, triad (36) involved DANCING only. In such cases, it is likely that subjects – regardless of their native language – can only associate in terms of same-PATH. It would be highly insightful to categorise those triads in groups reflecting MANNER types displaying fine-grained distinctions, absolute distinctions, and no distinction. Item analyses of responses based on those distinctions are likely to display variable results.

4.4. TOMATO MAN

Similar research has been undertaken using a digital tool designed by the Max Planck Institute for Psycholinguistics (Nijmegen, NL), e.g. Zlatev & David (2003, 2004), Bohnemeyer et al. (2004). The tool consists of digitised motion events displaying a computer prop in the shape of a red, smiling tomato performing motion with divergent PATHS and various MANNERS. Given that the tomato is round, those MANNERS are restricted to ROLLING, SPINNING, SLIDING, and JUMPING. Also, the projection screen is 2-dimensional, so PATHS are either from the left to the right of the screen or from the right to the left, using either a horizontal axis, or a vertical (or, more precisely oblique) axis. The screen is bare except for various details signalling GROUNDS, PATH ENDPOINTS or BOUNDARIES, e.g. a ramp, a hut, a cave, a tree, etc. Over seventy triads have been devised, and they essentially offer one target display showing e.g. tomato-man sliding up along the oblique ramp to the top right of the screen, and two alternates, e.g.

- (7) Tomato-man jumping up along the oblique ramp to the top right of the screen.
- (8) Tomato-man sliding down along the oblique ramp to the bottom left of the screen.

The triads thus contrast a target item against one MANNER alternate, e.g. (7), and one PATH alternate, e.g. (8). However, out of the seventy-plus triads, only twelve offer PATH and MANNER contrasts, such as the one exemplified in (7) and (8). Moreover, these twelve offer only four MANNER types, and only two PATHS types, namely UP-DOWN, and LEFT-RIGHT.

Subjects are asked to choose which alternate is most similar to the target, hence suggesting cognitive salience in categorising either in terms of PATH, or of MANNER similarity. The stimuli are thus different from the ones used in previously reviewed research. They are dynamic, digital, and use a fictive animated object as the motion FIGURE.

Research teams have used these triads to test the linguistic relativity hypothesis in the domain of motion across a variety of languages including e.g. Swedish, French, Dutch, German, Basque, Tamil, Turkish, Spanish, Catalan, Japanese, Yucatek, Lao, Hindi, Tidore, and more. They have done so testing a dozen subjects per language.

Studies have reported categorisation in favour of MANNER preferences overall, approximating >60% of instances (Zlatev & David 2003, Bohnemeyer personal communication, June 2003) – regardless of the native language of the subjects. Bohnemeyer et al. (2004) later reported a “significant effect of language” in categorisation, as they noted variation in those percentages in further research, following which “all languages with less than 50% manner choices are verb-framed.” The supporting graph for this suggestion lists four such languages, namely Jalonke, Yucatec, Basque and Tamil. Yet, further along the cline, we may also note Italian, Japanese, and Spanish with over 50% of MANNER choices. In fact, Spanish ranks the highest, i.e. 70% of MANNER choices, that is, Spanish subjects performed MANNER associations more than satellite speakers, e.g. Dutch speakers performed 65% of MANNER choices, and Germans performed under 60%. The credibility of the language effect is therefore highly questionable.

Zlatev & David (e.g. 2004) have further analysed responses with respect to PATH type, i.e. vertical versus horizontal. Horizontal PATHS were telic in that either an endpoint was explicit, e.g. TO-FROM, or a boundary was being crossed, e.g. INTO-OUT (see further discussion of telicity in Chapter 5). Vertical PATHS, on the other hand, were deemed atelic, that is, no endpoint was explicit, e.g. UP-DOWN. The authors noted that performance differed across language groups relative to the axis, so that PATH choices increased in the UP-DOWN atelic cases, in the French group. They followed up their initial study with another study which asked subjects to describe the films prior to making their choices. From these linguistic descriptions, they found that, in French, vertical PATHS were followed by MANNER information in the same clause as the verb in some 96% of instances, whereas horizontal PATHS were followed by MANNER information in the same clause as the verb in only 42% of instances. In horizontal (telic) PATHS descriptions, MANNER is therefore encoded using an additional clause. The authors suggest that an added clause entails an added cognitive processing load. From there on, they deduced that

The more telic the event, the more the goal needs to be explicitly represented. But to represent both the goal and manner in the same clause would lead to more cognitive load. So manner tends to be represented in an additional clause, the more telic the event. Representing manner explicitly makes it more functionally salient. Hence the more telic the event, the more *functional salience* of manner in a verb-framed language (ibid.).

They therefore suggest that MANNER is more salient in telic, horizontal, PATH events to French speakers only, because in those cases, MANNER encoding entails heavier cognitive processing. From there, the authors suggest a mild Whorfian effect with regards to PATH verticality. There are a number of problems with such claims. Indeed, the Swedish descriptions are not contrasted, so we have no reliable indication as to whether the extra cognitive load should also be obtained for the Swedish subjects. If it is obtained, then the results make little sense, in that lower MANNER responses should be obtained for both language groups, and not just the French speakers. Assuming that the extra cognitive load is not demonstrated, it then seems difficult to explain how the extra-clause encoding of MANNER would impact on performance when speakers have not been language-primed, unless Whorfian effects are not 'mild' but, on the contrary, extremely strong, to the extent that habitual clause semantics skews non-linguistic performance. Also, the fact that an additional clause is being used for the descriptions probably entails that in habitual expression, the extra clause is left *unsaid* – in which case, language effects are nonsensical, as they would reflect unidiomatic patterns of expression. Leaving MANNER unsaid in verb-languages has indeed been shown to be the case by Slobin's extensive research on cross-linguistic discursive patterns (see Chapter 5 for extra discussion). As such, the present research largely ignores these significant findings. Further, an intuitive analysis of telic versus atelic events suggests that the overt presence of endpoints is more likely to catch the cogniser's attention, whereas the absence of endpoints would entail the continuous motion of a FIGURE, thus mainly characterised by its MANNER of displacement. I would therefore suggest that indeed telic events are more likely to be PATH-salient in cognition, and atelic events to be MANNER-salient (see Chapter 7 for evidence in support of this point). As such, the results are, at the least, counter-intuitive. Finally, on a technical note, a dozen subjects remains a low figure for a test sample, and as such, it fails to constitute a reliable index of likely cognitive patterns. In addition, the analysis presented does not offer statistics relevant to the twelve triads, but instead, it provides occurrence frequencies of all fifty triads used. It seems difficult, therefore, to discern the statistical reality of the triads under concern, that is, the triads showing actual decision in terms of either PATH or MANNER by the subjects.

4.5. SUMMARY OF EXISTING RESEARCH

The above studies diverge in their findings and conclusions. Memory is generally found to be unaffected by language typologies. With regard to categorisation effects, Papafragou et al. (2002) find an equal distribution of scores for PATH and MANNER in both the Greek and English groups. Gennari et al. (2002) yield similar findings with Spanish speakers; however, they also observe that Spanish subjects display a preference for PATH when the experimental setting involves the linguistic description of the stimuli prior to categorisation. Finally, research on the Max Planck elicitation tool (e.g. Zlatev & David 2003) reports an overall preference for MANNER responses in tests with verb- and satellite-framed language speakers.

The Tomato-Man findings report on average a 60% preference for MANNER in categorisation tasks, whereas Papafragou et al. (2002) report a 50-50 scenario, and Gennari et al. (2002) claim a 60% overall preference for PATH. This brief review of related research thus indicates that results are far from uniform across experimental research. It is highly possible that diverging methodologies are responsible for a significant portion of the variability in responses. Indeed, the use of either static drawings, real-life motion films, or digitised computer tomatoes, is bound to yield very diverging conceptual representations of motion scenes (see Kopecka & Pourcel 2005). In addition, these studies used different quantities of triads to test subjects, i.e. 8 triads in Papafragou et al. (2002), 36 triads in Gennari et al. (2002), and fifty triads with 12 of relevance (tomato research). As such, those pieces of research are not transparently comparable.

Furthermore, weaknesses have been identified in all the studies discussed. Slobin's work was shown not to target linguistic relativity, but *Thinking for Speaking* instead, which fails to correspond to pervasive language effects on non-linguistic cognition. His stimuli were static pictures, and his data – though plentiful – remained linguistic throughout. His research illustrates an instance of circularity in relativistic terms, by failing to document non-linguistic claims with cognitive-only data, or at least, contrasting cognitive-only data with language-primed cognitive data. Papafragou et al. (2002), on the other hand, was shown to make inaccurate language-based predictions regarding the allocation of salience of PATH and MANNER in English. In doing so, it exemplified the typical tendency in relativity to oversimplify linguistic analyses in order to proceed to psychological testing. This testing proved to rely on too few stimuli items, i.e. 4 pictures for memory, and 8 triads for categorisation. The quantity and quality of motion events were thus barely contemplated, and indeed, the further analysis of discrete PATH and MANNER features (e.g. MANNER type, PATH endpoints) was not considered either. Hasty conclusions of a dismissive nature followed hasty testing and analyses. Gennari et al. (2002) proved more accurate on linguistic grounds, and more rigorous in terms of testing

methods. They used videoed stimuli, thus representing the dynamicity inherent in motion. They also used a significant amount of stimuli, 108 videos, amounting to 36 triads. It may be argued, nonetheless, that their lack of distractors encouraged strategy-based categorisation. The authors themselves noted task-on-task effects. In addition, the task administration procedure comprised highly controlled instructions, and the overall format decontextualised the task from realistic perspectives, thus conditioning performance to a high degree. Finally, the quality of the stimuli was at times questionable, and the quantity of subjects per testing format, i.e. averaging 15, seemed insufficient. Finally, the tomato-based research efforts seemed conducive to instigate further investigations using neat stimuli with minimal noise, and ease of display, which could result in great numbers of subjects being tested in different languages. The quantitative aspect was met linguistically; however, too few subjects were asked to perform the tasks. Furthermore, the nature of the computerised motion figure highly restricts its motion scope in terms of the crucial variables under investigation, namely *PATH* and *MANNER*. As such, very little of motion is being explored, and the applicability of findings on tomato motion to human motion conceptualisation is also likely to be restricted. This is important because human motion is the main type of motion conceptualised and expressed in language by speakers.

Despite these methodological issues, these results are nonetheless interesting, as they highlight the need to understand motion in greater depth, both linguistically and cognitively, prior to consistent testing. They also suggest – as Lucy has consistently suggested – that methodology and analysis must be carefully monitored in testing the covert relation between language and thought. As such, stimulus design and quantity, test subjects, linguistic resources, testing instructions, and so on, must be closely attended to in such investigations so as to prevent skewing the results towards unnaturalistic trends. The nature of experimental psychology necessitates a degree of control conditioning behaviour. The crux becomes one of minimising that degree, whilst promoting the chances for investigatory scope. Chapter 5 will thus examine the domain of motion in language in greater depth, in order to establish a sound basis for the further hypothesising of language effects. From this template, the remainder of the thesis will then implement experimental testing of the cognitive conceptualisation of motion events across language groups.

CHAPTER 5. MOTION IN LANGUAGE

This chapter presents a detailed analysis of the domain of motion both in experiential terms and in linguistic terms. Though such analyses have been presented in previous sections, Chapter 4 has displayed a variability too great with regard to findings and methods to accept existing models of understanding as final. This section re-visits motion with the aim of clarifying and fine-graining a definition of the domain in linguistic and non-linguistic terms. To this end, the first section defines an experiential understanding of the domain of motion, prior to examining the various linguistic frameworks explaining the encoding of that domain in language. The frameworks reviewed include Talmy's structural typology and Slobin's discursive cline. The third sub-section will question both frameworks, and an alternative model will be proposed in the light of some challenging data from French. From the understanding reached, a second section elaborates a set of specific predictions for the potential influence of motion linguistics on cognitive functions. This last part thus bridges a theoretical frame of understanding to its application for relativistic purposes in ensuing chapters.

Overall, this chapter crucially aims to offer a linguistic contribution to the thesis in terms of reviewed literature (section 5.1.2.), linguistic data provision (sections 5.1.3.2. to 5.1.3.4.), original linguistic analyses (section 5.1.3.5. and 5.1.3.6.), and innovative linguistic modelling (section 5.1.3.7.). These aims are motivated by the wish to (a) establish the validity and applicability of existing insights into motion linguistics in English and French, (b) establish prevalent patterns of actual use for positing relativistic hypotheses, and (c) satisfy methodological and epistemological requirements for thorough linguistic investigations of domain encoding prior to relativistic hypothesising and testing (see section 3.2.2.). Fundamentally, the question is to assess the existence and extent of cross-linguistic differences between English and French concerning habitual semantic construals of motion events.

5.1. MOTION

As discussed in Chapter 3, it is important to start by defining the domain of focus – here motion – independently of language, in order to identify the relevant non-linguistic dimensions of this domain and to avoid linguacentrism (Lucy & Gaskins 2003: 467). It should be noted that this point was first highlighted by Whorf himself (1956: 162):

Our problem is to discern how different languages segregate different essentials out of the same situation... to compare ways in which different languages differently 'segment' the same situation or experience, it is desirable to be able to analyse or 'segment' the

experience first in a way independent of any one language or linguistic stock, a way which will be the same for all observers.

Definitions of the domain of motion have been provided in the literature. However, a thorough review of all the definitions available may not be overly insightful. Below are relevant definitions of motion as provided by Talmy and Slobin, whose work have so far proved foundational for subsequent typological and experimental research:

- we treat a situation containing movement or the maintenance of a stationary location alike as a ‘motion event’. The basic motion event consists of one object (the ‘Figure’) moving or located with respect to another object (the reference-object or ‘Ground’). It is analysed as having four components: besides ‘Figure’ and ‘Ground’, there are ‘Path’ and ‘Motion’. The ‘Path’...is the course followed or site occupied by the Figure object with respect to the Ground object. ‘Motion’...refers to the presence *per se* in the event of motion or location...In addition to these internal components, a Motion event can have a ‘Manner’ or a ‘Cause’, which we analyse as constituting a distinct external event (Talmy 1985: 60-1).

a motion event [is]...the movement of a protagonist from one place to another (Slobin 1996b: 206).

the essence of motion is change of location – in Talmy’s terms, path (Slobin 2000: 161-2).

5.1.1. MOTION AS A DOMAIN OF EXPERIENCE

This section details the understanding of the motion domain adopted in the remainder of this thesis. Put simply, motion events imply the movement or displacement of an entity through space. The study of motion therefore implies the study of space. As mentioned in Chapter 4, motion fundamentally provides four central conceptual elements – as follows:¹

FIGURE	moving agent or entity, e.g. a ball
GROUND	spatial reference, e.g. a hill
PATH	directionality followed by the FIGURE, e.g. downwards
MANNER	fashion in which the FIGURE achieves motion, e.g. rolling

Hence,

- (1) The ball rolled down the hill.

Motion therefore typically supposes a FIGURE undergoing a change of spatial location with respect to a GROUND along a PATH, from a SOURCE following a TRAJECTORY to a GOAL, as in (2).
- (2) The dog ran out of the barn across the field to the house.

FIGURE MANNER PATH_{SOURCE} GROUND₁ PATH_{TRAJECTORY} GROUND₂ PATH_{GOAL} GROUND₃

¹ Following Talmy (1985: 128-9), these concepts are understood so that “Path refers to the variety of paths followed, or sites occupied by the Figure object”, “the Figure is the salient moving or stationary object in a motion event”, “the Ground is the reference-object in a motion event, with respect to which the Figure’s path/ site is reckoned”, and “Manner refers to a subsidiary action or state a Patient manifests concurrently with its main action or state.”

Motion is thus a dynamic domain of experience, i.e. it is not static. Note, however, that the notions of SOURCE or GOAL need not be apparent for there to be motion in a generic sense, e.g.

- (3) The dog is running around the house.
 FIGURE MANNER PATH GROUND

There is therefore a distinction between motion that is source-and-goal-oriented, as in (2), and motion that is not, as in (3). Conceptually, it is relevant to distinguish between motion event and motion activity as the conceptual emphasis of an event consists of the PATH of motion, e.g. (2) – which is considered the core schema of the event (c.f. Talmy 1991); whereas the conceptual emphasis of an activity consists of the MANNER of motion, which specifies a motion in progress, e.g. (3). In other words, the core schema of an activity is no longer PATH, but MANNER. So activities are essentially concerned with conveying MANNER information to the extent that PATH and GROUND information may become optional in linguistic encoding, e.g. (4).

- (4) The dog is running.
 FIGURE MANNER

In contrast to activities, events are essentially concerned with conveying PATH information, besides MANNER information, which itself may become optional, as in (5).

- (5) The dog crossed the road.
 FIGURE PATH GROUND

Motion events thus make the change of location explicit. However, they may not always translate the SOURCE or the GOAL of the PATH, or the crossing of boundaries, e.g. (6).

- (6) The dog ran up the street.
 FIGURE MANNER PATH GROUND

In (6), we may infer the SOURCE and the GOAL of the motion event, yet the cogniser/ hearer need not conceptualise either, as UP PATHS are continuous and do not specify departure points, e.g. FROM, nor endpoints, e.g. TO. This type of PATHS is also referred to as 'locative' or 'atelic' (e.g. Aske 1989). Other locative PATHS include e.g. DOWN, ALONG, AROUND. In contrast, PATHS may be 'telic,' involving explicit GOALS, whereby endpoints are saliently specified. Telic PATHS include e.g. IN, OUT, ACROSS, TO.

In addition, motion of a FIGURE may be spontaneous [X MOVES], as in (7), or it may be caused by an extra, independent agent [X MOVES Y], as in (8). Caused motion occurs when the moving entity is an inanimate object, incapable of self-motion, or when an animate agent is caused to alter its location or position due to the intervention of a motion-causing agent, e.g.

- (7) The dog jumped over the fence.
 FIGURE MANNER PATH GROUND

- (8)
- | | | | | |
|---------|--------|----------|------|-----------|
| The dog | pushed | the bone | into | the hole. |
| AGENT | CAUSE | FIGURE | PATH | GROUND |

Further, motion may be applicable to physical domains referring to agent parts, rather than to the whole agent, or body. The motion agent may then become a body part, sensory capacity, or the like, e.g.

- (9)
- | | | | |
|---------------|---------------|--------------|---------------|
| His eyes | ran | up and down | her figure. |
| VISION FIGURE | VISION MANNER | VISION PATHS | VISION GROUND |

Finally, the physical domain of motion may be extended to non-physical domains, in which case the motion becomes fictive, or metaphorical. Indeed, thoughts, emotions, and the like, may arguably be perceived to be in motion, e.g.

- (10)
- | | | |
|----------------|----------------|--------------|
| Success | went | to her head. |
| FICTIVE FIGURE | FICTIVE MOTION | FICTIVE PATH |

This thesis, however, concentrates on physical motion performed by animate, and in particular human, FIGURES – though it is hoped that the patterns yet to be discussed may further apply to extensions of the domain of physical motion, e.g. vision.

Overall, several dimensions may thus be identified in the domain of motion, namely:

- (11)
- the moving entity, i.e. FIGURE
-
- (12)
- the spatial reference, i.e. GROUND
-
- (13)
- the directionality followed by the FIGURE, i.e. PATH
-
- (14)
- the fashion in which the FIGURE moves, i.e. MANNER
-
- (15)
- the spatio-temporal sequence of the PATH, i.e. POLARITY – comprising (16)-(18)
-
- (16)
- the initial state of POLARITY, i.e. SOURCE
-
- (17)
- the median state of POLARITY, i.e. TRAJECTORY
-
- (18)
- the final state of POLARITY, i.e. GOAL
-
- (19)
- the motivation of the MOTION, i.e. CAUSE
-
- (20)
- the finality of the MOTION, i.e. RESULT

As mentioned in Chapter 4, languages differ mostly in their mapping of PATH- and MANNER-related CRs onto corresponding SRs, i.e. CRs (13)-(20). The following section elaborates on such mappings.

5.1.2. LINGUISTIC MODELLING OF MOTION IN LANGUAGE

This study focuses on the lexicalisation of motion in French and English, though it will also consider universal typological claims and their applicability to other languages. This section

presents Talmy’s famous typological work (e.g. 1985, 1991, 2000a & b) on the structural properties of motion expression in language, and Slobin’s discursive approach (e.g. 2004) to motion encoding. Specifically, this section aims to present an exemplified overview of motion linguistics at the lexical, structural, and textual levels, with a special emphasis on English and French.

5.1.2.1. Structural Framework of Description

Similar to the studies reviewed in Chapter 4, the present research concentrates on two motion CRs, namely PATH (or RESULT in the case of caused motion) and MANNER (or CAUSE), e.g.

- (21)

John

kicked

the door

open.

FIGURE

MANNER

GROUND

PATH
- (22)

She

flew

across

the Channel.

FIGURE

MANNER

PATH

GROUND

(21) and (22) illustrate how motion events are typically lexicalised in English. In each sentence, the subject corresponds to Talmy’s notion of FIGURE, whilst *the door* in (21) and *the Channel* in (22) correspond to the GROUND CR. As exemplified, the typical pattern in English requires the main verb to express MANNER² – mapping the action process of the motion event; whilst another grammatical relational category, labelled ‘satellite’ by Talmy, expresses the PATH (or RESULT) of the motion. In other words, the concepts of MANNER and PATH are both typically encoded in the verb complex/ phrase of the English sentence. Terminological clarification is needed here as Talmy uses idiosyncratic terms to describe those lexicalisation patterns. Talmy’s ‘satellite’ is traditionally referred to as a verb particle or verb complement in English, though it can also take the shape of a prefix or affix in other languages, or again of a non-head word in Tibeto-Burman languages, for instance (Talmy 1985: 102-3). Talmy defines the satellite as follows:

Present in many if not all languages, satellites are certain immediate constituents of a verb root other than inflections, auxiliaries, or nominal arguments. They relate to the verb root as periphery (or modifiers) to a head (ibid.: 102).

It is a grammatical category of any constituent other than a noun-phrase or prepositional-phrase complement that is in a sister relation to the verb root (Talmy 2000b: 102).

Satellites are thus distinct from prepositions in English and in Indo-European languages overall. Talmy (1985: 105) argues that a preposition stands in a sister relation to a non-verbal phrase, typically a GROUND-specifying constituent, e.g.

- (23) The child walked [*toward* the treehouse]_{pp}.

² Note that in (21) we also have an instance of CAUSE expressed by the main verb, in that John caused the door to open by kicking it. In his typology, Talmy treated MANNER and CAUSE as semantic equivalents, both linguistically encoded in similar ways (1985: 62-68); and further, PATH in this case encompasses a resultative meaning.

Unlike a satellite, a preposition is thus part of a constituent independent from the verb. As such, omitting that constituent effectively removes the preposition. In contrast, a satellite is not autonomous from the verb, and is not removed when a GROUND PP is omitted, e.g.

(24) The child [walked *away*]_{VC} [from the treehouse]_{PP}.

(25) The child [walked *away*]_{VC}.

Note that satellites are often followed by prepositions, as in (24), introducing GROUND information. In English, some [satellite+preposition] forms have merged into one, e.g. *into*, *onto*, e.g.

(26) The child walked *into* the room.

In this case, were the GROUND constituent removed, the merged form would split and retain the satellite with the verb root, e.g.

(27) The child walked *in*.

In addition, given the grammatical salience allocated to the verb complex, both the verb and the satellite receive stress. Unlike prepositions, therefore, a satellite is stressed (*ibid.*: 106).

Talmy (*ibid.*: 104) offers a preliminary list of English satellites, including *in*, *out*, *on*, *off*, *over*, *up*, *down*, *above*, *below*, *through*, *across*, *along*, *around*, *past*, *by*, *away*, *back*, *forth*, *apart*, *together*. English also offers satellites conflating [PATH+GROUND] information simultaneously, e.g. *home*. English further comprises a few prefixes acting as satellites, e.g.

(28) The bolt must have *unscrewed*. (*ibid.*)

Finally, English uses adverbs and adjectives as satellites, e.g.

(29) Susie slammed the door *shut*.

Besides the notion of 'satellite,' Talmy further introduces the expression 'verb complex,' which will be used in this thesis to the detriment of 'verb phrase.' This terminological choice is not only the one favoured in the motion research tradition, but it also enables a specific focus on the verb and its potential satellites, that is, on the surface elements translating the mapping of PATH and MANNER. Indeed, Talmy (1985: 102) defines this expression so that:

A verb root together with its satellites forms a constituent in its own right, the 'verb complex'. It is this constituent as a whole that relates to such other constituents as an inflectional affix-set, an auxiliary, or a direct object noun phrase.

The verb complex is thus a notion distinct from the more common 'verb phrase.'

In languages other than English, e.g. French, the lexicalisation pattern differs by requiring the sentence verb to express PATH, whilst an optional constituent may express MANNER. In other

words, the typical pattern in French entails that PATH appears in the verb complex and, more specifically, in the verb root, whereas MANNER does not, e.g.

- (30)

Jean

[a ouvert]_{VC}

la porte

d'un coup de pied.
- PATH

MANNER
- John*

opened

the door

with a kick.
- (31)

Elle

[a traversé]_{VC}

la Manche

en avion.
- PATH

MANNER
- She*

crossed

the Channel

by plane.

It is important to consider that the lexicalisation patterns are not simply reversed, so that the two language types use different grammatical categories to map PATH and MANNER. Such an understanding fails to appreciate the obligatoriness of those very categories. Indeed, only the subject, the verb complex and its direct objects constitute obligatory constituents in both languages. In English, this entails that the linguistic mapping of the FIGURE, PATH, MANNER and GROUND is typically obligatory. In contrast, in French, the linguistic mapping of MANNER is not obligatory. Structurally speaking, French may thus express the motion events in (21) and (22) as follows:

- (32)

Jean

a ouvert

la porte.
- PATH
- John*

opened

the door.
- (33)

Elle

a traversé

la Manche.
- PATH
- She*

crossed

the Channel.

In this case, the same motion events are semantically construed in diverging ways, yielding different imagistic frames of the same reality. This structural property holds consequences at the textual and lexical levels, in terms of styles and resources for expression (see section 5.1.2.2.).

According to Aske (1989) and Talmy (e.g. 1991), omitting MANNER information in motion mapping is unsurprising, as PATH is the defining conceptual element, or core schema, of motion, whilst MANNER only constitutes a subordinate, or supporting, piece of information – understood as a co-event. To do justice to Talmy’s argument (ibid.: 483), it is worth quoting him at length:

Since the figural entity of any particular framing event is generally set by context and since the activating process [the motion] generally has either of only two values, the portion of the framing event that most determines its particular character and distinguishes it from other framing events is the schematic pattern of association with selected ground elements into which the figural entity enters. Accordingly, either the relating function alone or this together with the particular selection of involved ground elements can be considered the schematic core of the framing event... the relating function that associates

the figural entity with the ground elements among which the transition takes place constitutes the *path*. The core schema here will then be either the path alone or the path together with its ground locations.

From this schematic understanding of motion as a PATH-framing event, Talmy (e.g. 1985, 1991) proposed an influential and *prima facie* convincing universal typological categorisation of lexicalisation patterns for encoding motion events applying to, among others, Indo-European languages, such as English and French. As shown above, languages preferentially frame the PATH of motion either in a verbal satellite, e.g. English in (34), or in the verb itself, e.g. French in (35) – thus proposing that languages are either *satellite-* or *verb-framing* for PATH of motion. An ensuing difference between both types of languages concerns the encoding of MANNER, since English expresses it in the main verb, whereas French cannot afford this slot to MANNER as it is already allocated to PATH, and hence lexicalises MANNER information in optional constituents, e.g. gerunds, PPs, adverbs.

(34)	Subject [FIGURE]	Verb [MANNER]	Satellite [PATH]	Object [GROUND]
	Julie _F	ran _M	across _P	the street _G .
(35)	Subject [FIGURE]	Verb [PATH]	Object [GROUND]	Optional constituent [MANNER]
	Julie _F	traversa _P	la rue _G	en courant _M .
	Julie	<i>crossed</i>	<i>the street</i>	<i>running</i> .

Note that the two patterns are not exclusive. Rather they are typical in terms of actual usage. It is possible therefore to conceive of satellite languages using a PATH verb with or without optional MANNER information, e.g.

(36)	The child _S	entered _{VC}	the room _O	(on tiptoes) _{OpC} .
	FIGURE	PATH	GROUND	MANNER

As Talmy (1985: 72) explains,

English [satellite pattern] does have a certain number of verbs that genuinely incorporate Path, as in the Spanish [verb pattern] conflation type, for example: *enter, exit, pass, rise, descend, return, circle, cross, separate, join*. And these verbs even call for a Spanish-type pattern for the rest of the sentence. Thus, Manner must be expressed in a separate constituent... by contrast with the usual English pattern. But these verbs (and the sentence pattern they call for) are not the most characteristic of English. In fact, the majority (here all except *rise*) are not original English forms but rather borrowings from Romance, where they are the native type.

Likewise, verb-framed languages may display satellite framing (c.f. Kopecka 2004), e.g.

(37)	L'enfant _S	[courut _V	dehors _{Sat}] _{VC} .
	FIGURE	MANNER	PATH
	<i>The child</i>	<i>ran</i>	<i>out(side)</i> .

Note, however, that the latter possibility is not accounted for in Talmy's reports. These patterns receive greater attention in section 5.1.3.

Patterns similar to those shown in (37) have been discussed by Aske (1989) with reference to Spanish. He noted that supposedly verb-framed languages can use sentence structures resembling the satellite formula, i.e. using a MANNER verb and a PATH complement. Aske (*ibid.*) made a useful distinction to explain the variable use of structural patterns in verb languages. He identified two types of PATH, i.e. locative, e.g. (38), and telic, e.g. (39). TELIC PATH phrases are directional and/ or resultative. TELICITY entails an end-point, whereas ATELIC PATH phrases are purely locational.

- (38) a. We walked along the beach.
b. He drove down the hill.

- (39) a. We walked into the room.
b. She blew out the candle.

The argument is that this conceptual difference between TELIC and LOCATIVE PATHS generates differentiated mapping onto semantic representations in verb-framed languages – here, at the structural level, e.g. (40) and (41). Aske's distinction is thus useful, refining Talmy's broad classification, and presenting yet another CR relevant to the structural mapping of motion SRs, namely TELICITY. Overall, verb-framed languages seem able to reproduce the atelic pattern used in satellite languages. On the other hand, they cannot conflate MANNER in the main verb in the case of telic PATHS, e.g.

- (40) a. Nous avons marché le long de la plage.
We walked along the beach.
b. Il a conduit en bas de la colline.
He drove to the bottom of the hill.

- (41) a. *?Nous avons marché dans la pièce.
We walked in the room.
b. *?Elle a soufflé sur la bougie.
She blew on the candle.

Note that (41a) and (41b) are not ungrammatical as such, but they fail to translate the sentences in (39). In (41a) the meaning is altered to a locational state, whereby one is walking inside a room, with no telic notion of entering or exiting it. In (41b), the French sentence fails to express the PATH altogether. The grammatical translations of (39a) and (39b) would instead be:

- (42) a. Nous sommes entrés dans la pièce.
We entered (in) the room.

- b. Elle a éteint la bougie.
She extinguished the candle.

In such telic events, verb languages tend to omit MANNER SRs. Such SRs indeed render the sentence structurally clumsy and arguably unacceptable. In other words, MANNER SRs are not only optional; in telic events, they may become undesirable altogether, that is, their encoding is *not* an option, e.g.

- (43) a. * ?Nous sommes entrés dans la pièce en marchant.
We entered (in) the room walking.
 b. * ?Elle a éteint la bougie en soufflant (dessus).
She extinguished the candle by blowing (on it).

This structural constraint in the semantic mapping of telic events has also been referred to as the *boundary-crossing constraint* in verb-framed languages (e.g. Slobin 1997: 441):

It appears to be a universal characteristic of V-languages that crossing a boundary is conceived of as a change of state, and that state changes require an independent predicate in such languages... When a path crosses a boundary, then, it is no longer possible to accumulate a series of grounds to a single verb, because the state-change from one side of the boundary to the other will be expressed by a separate verb with its associated ground.

Consider, e.g.

- (44) Je_S marchais_V [le long de la plage]_{PP} [vers le phare]_{PP}.
 FIGURE MANNER ATELIC PATH₁ GROUND₁ ATELIC PATH₂ GROUND₂
I walked along the beach toward the lighthouse.
- (45) Je_S franchis_V [le seuil]_O et pénétrai_V [dans la boutique]_O.
 FIGURE TELIC PATH₁ GROUND₁ TELIC PATH₂ GROUND₂
I crossed the threshold and entered (in) the shop.

Aske (1989) further suggests that motion events framed by locative types of PATH yield an ACTIVITY – rather than EVENT – construal:

It seems that activity/ manner verbs [in Spanish] that strongly imply motion work best with the English pattern (ibid.: 3).

The conceptual importance of distinguishing motion activities and motion events has already been highlighted in section 5.1.1. The case for such a distinction is now also linguistically motivated – at least with respect to verb-framed languages. This point will be discussed further in the light of French data in section 5.1.3.2.

5.1.2.2. Discursive Framework of Description

A side-effect of these lexicalisation patterns is that MANNER is typically left unsaid altogether in the verb-framing of motion events – as opposed to activities. Indeed, though MANNER may be readily encoded in an optional constituent in those languages, the extra grammatical load engendered renders its expression undesirable. It follows that in natural discourse, MANNER of motion is typically expressed in language only if relevant to the construal semantics. In other words, MANNER has to be the central point of a sentence for it to be expressed (Naigles et al. 1998). On the other hand, MANNER is near-systematically encoded in satellite languages, rendering this schema “an inherent component of directed motion” (Slobin 2004: 235). This structural property of satellite- and verb-framing semantics has further entailments at the lexical, sentence, and textual levels.

As already noted in Chapter 4, lexical motion verbs in both language types generate quantitatively and qualitatively different SRs. Both language types comprise basic MANNER-of-motion SRs, translated in verbs such as *walk* (*marcher*), *run* (*courir*), *fly* (*voler*), *jump* (*sauter*), *dance* (*danser*), and so on. However, satellite languages further afford a rich lexis of fine-grained MANNERS, such as types of WALK, e.g. *march*, *stride*, *stroll*, *tiptoe*, *plod*, *tramp*, *stalk*, *stagger*, or types of JUMP, e.g. *hop*, *skip*, *leap*, *bounce*, *bound*, *somersault*, *vault*. In comparison, verb languages do not lexicalise those CRs as readily. To appreciate the nature of those semantic differences, it is worth considering an (incomplete) list of WALK verbs in English and French (see Table 5.1.).

Table 5.1. Examples of WALK verbs in English & French.³

English	French	English gloss
To drudge	Marcher péniblement	<i>To walk tediously</i>
To march	Marcher au pas	<i>To walk stepping</i>
To plod	Marcher d'un pas lent	<i>To walk with a slow step</i>
To sashay	Marcher d'un pas léger	<i>To walk with a light step</i>
To saunter	Marcher d'un pas nonchalant	<i>To walk with a nonchalant step</i>
To scoot	Marcher rapidement	<i>To walk quickly</i>
To scuttle	Marcher précipitamment	<i>To walk hurriedly</i>
To shamble	Marcher en traînant les pieds	<i>To walk dragging one's feet</i>
To shuffle	Marcher en traînant les pieds	<i>To walk dragging one's feet</i>
To sidle	Marcher de côté, furtivement	<i>To walk sideways, furtively</i>
To slink	Marcher sournoisement, honteusement	<i>To walk with a mean or shameful air</i>
To slog	Marcher avec effort, d'un pas lourd, avec obstination	<i>To walk with effort, with a heavy step, with obstinacy</i>
To sneak	Marcher furtivement	<i>To walk furtively</i>
To stalk	Marcher d'un air digne ou menaçant	<i>To walk with a dignified or threatening air</i>
To stomp	Marcher d'un pas lourd, bruyant	<i>To walk with a heavy or noisy step</i>
To stride	Marcher à grands pas	<i>To walk with great steps</i>
To stroll	Marcher sans se presser, nonchalamment	<i>To walk without hurrying, nonchalantly</i>
To tiptoe	Marcher sur la pointe des pieds	<i>To walk on tiptoes</i>
To toddle	Marcher à pas hésitants	<i>To walk with hesitating steps</i>
To traipse	Marcher d'un pas traînant ou errant	<i>To walk with a dragging step or wandering aimlessly</i>
To tramp	Marcher d'un pas lourd	<i>To walk with a heavy step</i>
To trundle	Marcher lourdement, bruyamment	<i>To walk with a heavy, or noisy step</i>
To wade	Marcher laborieusement dans l'eau	<i>To walk laboriously through water</i>
To waddle	Marcher comme un canard, en se dandinant	<i>To walk like a duck, lolling</i>
To whiz	Marcher à toute vitesse	<i>To walk with great speed</i>

In other words, MANNER fine-graining is poorly available and codable in French (and in verb languages in general), whereas it is highly codable in English (and in satellite languages overall) (Slobin 2004: 237). French typically necessitates complex phrase constructions where English requires single lexical verbs. Telling examples further include e.g.

- (46) faire du vélo
do some bike
'to cycle'
- (47) donner un coup de pied
give a blow of foot
'to kick'
- (48) faire du parachutisme en chute libre
do some parachutism in free fall
'to skydive'

³ Translations were taken from *Le Robert & Collins Senior* unabridged bilingual dictionary (1993).

In fact, Slobin (ibid.: 251) reports dictionary research on intransitive MANNER verbs in regular use listing under 75 items in Romance, Turkish and Hebrew, in comparison to over twice as many items in Germanic, Slavic, Hungarian and Mandarin.

At the sentence level, satellite languages elaborate complex combinations of PATH sequences – also labelled ‘journey’ (Slobin 1996a: 202) – as economically codable in verb satellites, e.g.

(49) Come right back down out from up in there! (Talmy 1985: 102).

In addition, PATHS are often accompanied by GROUND details. Motion sentences thus result in ‘objectively’ descriptive SRs, in that they provide explicit renderings of such CRs, instead of leaving them to be inferred. Consider, e.g.

(50) There is in the Midlands a single-line tramway system which boldly leaves the country town and plunges off into the black, industrial countryside, up hill and down dale, through the long, ugly villages of workmen’s houses, over canals and railways, past churches perched high and nobly over the smoke and shadows, through stark, grimy cold little market-places, tilting away in a rush past cinemas and shops down to the hollow where the collieries are, then up again, past a little rural church, under the ash trees, on in a rush to the terminus (Lawrence, *England, My England* – from Slobin 2004).

This type of PATH and GROUND elaboration, or JOURNEY, is not present in verb languages, at the sentence level. As illustrated in (45), PATH encoding is typically in the verb root, hence necessitating several verb complexes for the juxtaposition of PATHS and their corresponding GROUNDS. A tentative French translation of (47) shows this most clearly:

(51) ...un système de tramway qui plonge dans un paysage industriel sombre, qui chemine en amont et en aval, qui traverse les villages laids et allongés des maisons d’ouvriers, qui passe par-dessus canaux et chemins de fer, dépasse des églises haut perchées...

...a railway system which plunges into the black, industrial countryside, which path(V) uphill and downhill, which through(V) the long, ugly villages of workmen’s houses, which passes over canals and railways, passes churches perched high...

This example of translationese illustrates that, textually speaking, the lexical and structural resources available in French cannot afford the same organisation of motion CRs without generating unidiomatic texts with complex structures and heavy semantic loads, and hence

each type of lexicalisation pattern engenders a type of [rhetorical] style (Slobin 1997: 443).

With respects to the PATH and GROUND CRs, therefore, satellite languages may specify one MANNER verb together with several PATHS and GROUNDS, whereas verb languages specify one PATH verb and possibly one GROUND element in a complement – rarely more (ibid.: 442). Furthermore, English can specify both LOCATIVE and TELIC PATHS in great quantity via the use of satellites. French, on the other hand, needs separate clauses and encodes TELIC PATHS more

readily. As a result, French texts encode fewer motion events, or PATH segments, in linguistic expression, due to its non-economical means for doing so (ibid.: 447).

To ‘compensate’ for this seeming lacuna, verb languages expand on contextual descriptions, e.g. scene details, agent descriptions, emotional states (ibid.: 450). In other words, CRs such as GROUNDS are described independently of occurring motion in typical textual instances. Such descriptions no longer entail a dynamic construal of the scene, but a static one instead. Expanding on physical properties of the scene independently of motion events and activities allows verb languages to be more succinct in their use of motion-describing sentences. These may now be fewer, and specify either PATH alone – typically telic, indicating endstates – or MANNER alone in the case of a continuous activity. Indeed, given the added scene-setting descriptions, the hearer/ cogniser is capable of inferring dynamic elements of the motion scene left unsaid. Adding explicit descriptions of motion PATHS, GROUNDS, and MANNERS would encumber texts with semantic redundancy – at least in a pragmatic sense.

In contrast, satellite language structures and lexical resources are more conducive to the ready expression of the dynamic CRs in motion. Hence, there is little need for English to expand on static details in motion scenes. These static CRs may be inferred on the basis of MANNERS, PATH SEGMENTS, and GROUNDS (Slobin 1996a: 204). In short, motion scenes are construed more dynamically in English than in French. Those motion scenes are richly documented in terms of MANNER of displacement in English. Finally, they are detailed in terms of PATH segments more systematically in English, whether those segments be locative or telic; whereas French privileges the staticity of TELICITY in PATH expression, hence encoding the FINALITY of motion scenes more than their LOCATION – which is specified independently in static scene descriptions. Given the dynamicity of English motion expression through MANNERS and PATH segments, events are therefore construed with respects to their temporal dimension as well. Indeed, MANNERS mark given extents of duration through time, and PATH segments highlight temporal sequencing in the progression of movement. Such TEMPORALITY – or ASPECT – is not rendered so evidently in static construals of events, at least not in terms of DURATION. What is semantically salient in French construals of events, however, is the TEMPORAL ENDPOINT or RESULT of those events. In Vinay & Dalbernet’s (1958: 131) words:

Le français s’occupe avant tout de résultat... l’anglais suit le déroulement du temps.

French deals primarily with results... English follows the unfolding of time.

Taking all the above considerations into account – the list is not exhaustive – has thus enabled us to characterise motion linguistics in fuller terms than those offered at the structural level only,

e.g. Talmy's typology. Talmy's typological framework, however, has the valuable advantage of classifying languages neatly for subsequent analysis. Yet, typologies 'leak' in general, and typological classifications do not always afford a tight fit for languages:

as a general caveat, it should be remembered that typological characterisations often reflect tendencies rather than absolute differences between languages (Berman & Slobin 1994: 118).

Reaching beyond structural possibilities to usage practices is thus critical to a more accurate appreciation of the mapping of motion CRs onto SRs. Researchers are primarily indebted to Slobin (e.g. 1997, 2004) for such extensive insights on the discursive dynamics animating the domain of motion. In accordance with Whorfian concerns, his aims have been to add contextual relevance, cross-linguistic data, and semantic characterisation to Talmy's ground-breaking advances on motion lexicalisation; hence, enabling language-specific definitions of rhetorical styles, or "habitual patterns of expression" (2004: 223):

A structural description... consciously ignores certain aspects of language behaviour such as frequency of occurrence... In the case of experimental investigations relative frequency will probably be an even more important variable; perhaps the single most significant factor. This suggests that experimentation should be preceded by a thorough investigation of actual usage on the language behaviour level (MacLay 1958: 229).

To further justify this enterprise, Slobin (e.g. 2004: 249) reminds us of the variability existing across languages with respects to the applicability of Talmyan predictions. Indeed, languages such as e.g. Niger-Congo, Hmong-Mien, Sino-Tibetan, Tai-Kadan, Mon-Khmer, Austranasian, lexicalise both MANNER and PATH in serial-verb constructions where neither the one nor the other verb may be considered the main verb. That is, both motion CRs are encoded in obligatory categories of equal importance in the sentence, namely verbs (see e.g. Zlatev & Yangklang 2004). Other languages, such as Algonquian, Athabaskan, Hokan and Klamath-Takelman, lexicalise the two CRs in a single verbal form (see e.g. DeLancey 1989). That is, motion verbs in those 'bipartite' languages express both MANNER and PATH at once – what Kopecka (e.g. 2004) has also labelled 'hybrid' verbs. In addition, some languages, such as Jamingjung, use a PATH- and MANNER-neutral verb, e.g. *go*, and combine it with preverbs expressing both MANNER and PATH (see e.g. Schultze-Berndt 2000). Finally, some verb languages, such as Mayan languages, do not encode either PATH (as expected) or MANNER in the main verb; instead, PATH appears in e.g. adverbs, and their non-satellite status remains ambiguous.

In the light of this variability, and together with the aim of providing a useful model for discourse analysis, Slobin (2004) suggests a more holistic approach to understanding linguistic expression for motion. He offers a 'cline of MANNER salience' along which the world's languages would rank – instead of a strict binary typology. Along this cline, 'high-manner-

salient' languages provide an "accessible slot for manner" (ibid. 250) in elements such as main verbs (e.g. English, Russian), serial-verb constructions (e.g. Mandarin, Thai), morphemes in bipartite verbs (e.g. Algonquian, Athabaskan), preverbs (e.g. Jaminjung languages), or ideophones (e.g. Basque, Japanese); whereas 'low-manner-salient languages' (e.g. Romance, Semitic, Turkic languages) "require additional morphology" (ibid. 253) to encode MANNER information, e.g. gerunds, adverbs, PPs, so that "manner is subordinated to path" (ibid. 250). In other words, Slobin suggests adopting a continuum based on the codability extent of MANNER, which is the linguistically variable SR in expression. The choice of a cline instead of a categorising typology allows for linguistic idiosyncracies and discrepancies. In short, a continuum is more structurally forgiving than a typology.

This approach further takes into account the discursive side-effects of typological distinctions, noting, for instance the rich granularity of MANNER distinctions in satellite-framed lexicons, as opposed to the overall poor encoding of MANNER information in verb-framed languages;⁴ as well as the preferential rhetorical styles emergent from linguistic resources, together with cultural and aesthetic dynamics, and communicants' aims and motivations (see Slobin 2004 for a discussion of the latter points). This discursive framework has the advantage of considering each language's resources and usage patterns, and is thus better empirically informed. Yet, it also lacks some structural level of predictability in a typological sense, so crucially useful in applications of linguistics analyses.

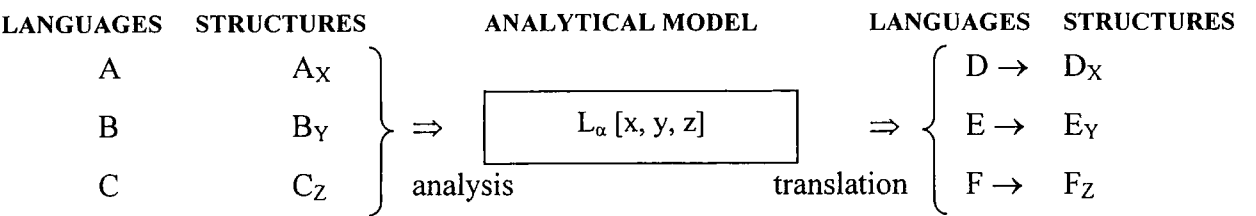
5.1.2.3. Summary

The main weakness of the Talmyan approach consists of its seeming departure from English and Spanish, which conform arguably well to satellite- and verb-framing lexicalisation patterns (yet see e.g. Aske 1989). From there, the typology generalises to the rest of the world's languages. Hence current research is increasingly showing shortcomings in the Talmyan typology – as illustrated in the preceding section.

Talmy's analysis starts from grammatical structures. The problem is the well-known fact that grammatical artefacts get incredibly idiosyncratic, which leads to a lack of valid comparability when local structures have been formalised onto a theoretical template which is too generalising. Such a point of departure is best suited to the ad hoc analysis of a few languages. However, they unavoidably raise the problem of theoretical transparency, translatability of analysis and further application to other languages (see Figure 5.1. for the schematisation of this problem).

⁴ Note, however, that this granularity is not consistently present in all satellite languages, e.g. Polish (Kopecka, personal communication, July 2005).

Figure 5.1. Process of structural characterisation & classification.



However, empirical cross-validation typically demonstrates that the ‘translation’ stage of prediction is too simplistic. More often than not, languages do not conform to transparent equationism. Data may reveal, e.g.

- (52) D → D_{XZ}
E → E_{YY}
F → F_{ZW}

Hence, typological models remain useful, but they are limited because the analyses are either too generalising, based on just a few languages, or again too superficial when examining new data – due to the definitional need to identify patterns in an economical way. These analyses are hence rarely completely wrong but they lack idiosyncratic specificity, and therefore may potentially lead to erroneous predictions and understandings in further linguistic investigations as well as in experimental applications of the linguistic facts – as required in linguistic relativity studies (c.f. Maclay 1958: 131, as quoted above).

On the other hand, Slobin’s discursive cline consists of departing from individual language analyses in a holistic fashion, which integrate grammatical patterns, quality of lexis, discourse styles, extralinguistic parameters, and so on. The picture emerging from the analysis is therefore very rich in idiosyncratic precision, and thus partially remedies the Talmyan shortcomings. Its pitfall, however, is the lack of objective comparability – in a mathematical equation sense – that ensues because each language is analysed in its own terms. Comparison is mainly afforded by abstraction and feature specificity. Though abstracting and specifying is entirely feasible in all-feature-integrative approaches, the picture gets unavoidably distorted (ignoring some aspects and resulting in quantifying features of interest only), and the original all-integrative effort seems to now lack a purpose.

In short, Talmy’s typology generalises too much to be useful and Slobin’s cline specifies too much to be comparative. Comparability is, in a word, what seems to pose a problem with either approach. I would argue that this difficulty arises as a result of both analysts’ departure from language, in that, whether specific or holistic, facts of language remain specific to the code under observation. It follows that ensuing comparisons with other languages will inevitably raise

discrepancies or produce distortions of the new data. A cline annihilates this possibility, but, without further elaboration, it fails to present a fixed template of features for subsequent analyses and applications. Furthermore, as Slobin (2004: 247, 250) correctly highlights:

Talmy's starting point, with regard to motion events, was to identify the means of expression of path... [yet] more is at play than expression of path by a verb or a non-verb.

Given the core schematicity of PATH in motion events, structural descriptions have reduced their insights to the expression of this feature, and little else beyond it. As Slobin's research on narratives and pieces of discourse has shown, such a reduction does not suffice to characterise motion event expression. The domain, together with its means of expression, goes beyond the complexity of PATH encoding. However, Slobin's cline also seemingly reduces the analytical framework for motion to one such variable, namely MANNER. Though his framework incorporates more qualitative insights than structural paradigms, it remains an incentive to simplifying motion in terms of whether or not MANNER is expressed. I would likewise argue that more is at play than expression of MANNER by a verb, a non-verb, or a \emptyset SR.

Theoretically speaking, departing from language descriptions and preliminary analyses for the identification of central schemas, whose expression – at first glance – seems to vary cross-linguistically, is further conducive to linguacentric tendencies – what Lucy (2003) dubbed 'semantic accent effects', as detailed in section 3.2.2.1.

5.1.3. CONCEPTUAL MODELLING OF MOTION IN LANGUAGE

To remedy the above, I would argue for the need to adopt a neutral point of analytical departure instead, i.e. not from existing language patterns, but instead from domain features of a schematic nature. I would thus suggest departing from the 'objective' reality, and from there, investigating how each language elaborates the framing of the schemas involved. Hence, the analytical springboard is not idiosyncratic but conceptual – thus theoretically comparable, and possibly economical too.

In the present case, I suggest taking motion dimensions as points of departure. The endpoint of the analyses should provide the integration of those dimensions in linguistically-informed frames.

The advantage of a conceptual approach is that it still takes all language aspects into account (e.g. grammar, lexis, discourse styles), and from each language's perspective – but it retains the ability to predict language patterns for comparative purposes.

For the purposes of the present study, it also entails that both English and French are better understood from their own point of view rather than from a linguacentric viewpoint

(typically English, at least in the Talmyan model). In the French case, it entails that the dimensions of e.g. FIGURE and GROUND are better characterised and, hence, French is not perceived as all round MANNER-deficient or MOTION-deficient. Descriptions as provided in preceding section (e.g. Table 5.1.) are conducive to forming such impressions. Yet, as Slobin (2004: 237) reminds us:

Verb-framing does not “suppress” attention to manner. Manner of motion is too important for human beings to ignore.

This section centrally aims to take an empirical, usage-based approach to investigate and analyse motion linguistics in French and English. It presents original data to assess the validity of Talmy’s structural typology and of Slobin’s discursive cline, especially with regards French, through an illustration of the structural means available for the expression of motion in *actual* usage. For this purpose, we⁵ collected naturalistic and controlled language data from native English and French speakers – in both verbal and written formats. Finally, in order to evaluate the acceptability of the various patterns found in the elicited data, we further asked an unrelated sample of native speakers to complete grammaticality judgements. This presentation will conclude with the elaboration of a conceptual model of motion linguistics, namely *path maps*.

5.1.3.1. Procedure

Using 45 video clips depicting human motion scenes in real-life settings (see Appendix C), 30 English speakers and 40 French speakers were asked to describe in one sentence the visualised stimuli, hence obtaining 1350 English sentences and 1800 French sentences on motion events. 85% of English sentences mapped MANNER in the main verb and PATH in a satellite, and only 15% of sentences used a PATH main verb with no MANNER elaboration. The French sentences, on the other hand, encoded PATH in the main verb in 65% of sentences, leaving 33% of sentences conflating MANNER in the main verb, and 2% using nominalisations and no verb phrase. In other words, the data supports the Talmyan model for satellite and verb framing in English and French. However, French adheres much less closely to that model than English (see below).

In addition to decontextualised elicitations, narrative data was also collected. Using a four-and-a-half minute-long extract from Charlie Chaplin’s *City Lights*, 22 English speakers and 25 French speakers were asked to perform a free prose recall task straight after visualisation, hence obtaining a large number of verbal descriptions of contextualised motion scenes. The data yielded 594 French statements and 591 English statements all pertaining to motion. Again, variability in construction types was apparent in the French data, whereas English largely

⁵ The data collection and analyses of grammaticality judgements were conducted jointly with Dr. Anetta Kopecka (Max Planck Institute for Psycholinguistics, Nijmegen, NL).

conformed to prototypical satellite-framing. This task was particularly insightful to illustrate verbal lexical resources in both languages, with English displaying a greater and more finely-grained MANNER-verb lexicon (see also Chapter 8).

Based on the variability of patterns obtained from the French elicitations (see section 5.1.3.3.), 129 French speakers were asked to provide acceptability judgements of 85 motion sentences, using a 1-5 scale of acceptability. Sociological variables (e.g. age, gender, region) were monitored and proved insignificant when correlated to data variability across subjects. The following variability is therefore believed to be largely linguistic and idiosyncratic.

Note that the majority of subjects in the three types of task were unrelated sample pools.

5.1.3.2. English Verbal Constructions

This section presents a summary of the patterns for motion event encoding found in the elicitation tasks mentioned above. Overall, English affords a tight fit within the Talmyan typological model for motion encoding. This has been extensively documented in the literature and was confirmed by the sentence and narrative elicitation data. In the sentence task on the 45 video clips, an overwhelming 85% of sentences encoded motion following the satellite-framing pattern, whereby MANNER is conflated in the main verb slot, and PATH is conflated in a verbal satellite, e.g.

- (53) A man_F [is] tiptoeing_M upstairs_P.
- (54) A man_F [is] cycling_M along_P a road_G.
- (55) A man_F [is] pushing_{M/Cause} a door_{O/F} open_{Result}.

Thus, MANNER verbs were used extensively by all English speakers. In this task, such verbs included e.g. *walk, run, jog, tiptoe, limp, stroll, ride, scooter, skate, cycle, push, pull, slide, drag, kick, dive, climb, throw, wave*. A substantially more varied range was further found in the narrative task using the Chaplin video extract, e.g. *jump, sit, bump, dunk, grapple, overbalance, fall, drag, hop, drop, pop, flap, plunge, swim, tip, struggle, stagger, knock, kneel, pat, skip, bend, splash, somersault, drown, reach, grab, flail, wander, hang, stumble, attach, tie, wipe, dust, step, shake, pick, thrash, titter, hook, nip*.

Verb complexes expressing PATH information only also figure in the English data – such instances constitute 15% only of constructions in the sentence elicitation task, e.g.

- (56) A man_F closes_{Result/P} a door_O.
- (57) A man_F [is] crossing_P a road_G.

PATH verbs included *close, shut, open, enter, exit, cross, leave, retrieve, arrive*. English thus also makes some use – though marginal – of verb-framing in motion.

To summarise, English expresses motion most typically by framing MANNER in main verbs and PATH (or RESULT) in satellites – as documented by Talmy and others. Both MANNER and PATH are thus obligatory in typical motion sentences in English. If one component is missing, it will be MANNER, in which case English becomes verb-framing with PATH information in the main verb.

5.1.3.3. French Verbal Constructions

This section presents a summary of the patterns for motion event encoding found in the French elicitation tasks. The constructions in (58)-(61) conform to the Talmyan typology, according to which the verb encodes PATH information in languages like French. Such constructions may dispense of MANNER information altogether, e.g. (58), or specify MANNER in an adjunct, such as a PP, e.g. (59), a gerund, e.g. (60), or an adverb, e.g. (61).

- | | | | | |
|------|-----------------|--------------------|-----------------------|--------------------------------------|
| (58) | il _F | retra _P | chez lui _G | |
| | he | returned | home. | |
| (59) | il _F | retra _P | chez lui _G | sur la pointe des pieds _M |
| | he | returned | home | on tiptoes. |
| (60) | il _F | retra _P | chez lui _G | en courant _M |
| | he | returned | home | running. |
| (61) | il _F | retra _P | chez lui _G | précipitamment _M |
| | he | returned | home | in a sudden rush. |

Finally, it is also common for French speakers to use ‘juxtaposition verb-framing patterns’ in on-line descriptions of motion events, whereby two verb phrases co-exist in one sentence, one encoding a motion activity with a MANNER verb, and the other encoding a motion event with a PATH verb alone, e.g.

- | | | | | | | |
|------|-----------------|--------------------|---------------------------|------|---------------------|------------------------------|
| (62) | il _F | court _M | dans une rue _G | puis | rentre _P | dans une maison _G |
| | he | runs | in a street | and | enters | [into] a house. |

The constructions in (63)-(66), on the other hand, present ad hoc patterns which do not conform to the Talmyan typology. They show MANNER information conflated in the main verb of the motion event sentence and PATH information encoded in an adjunct, such as a PP, e.g. (64), or a gerund, e.g. (65), or even both, e.g. (66). These patterns are neither satellite- nor verb-framed. Instead, they upset the Talmyan verb-framing pattern so that the prototypical syntactic slots for

PATH and MANNER information are swapped round. The resulting grammatical organisation of those sentences may be better described as ‘reverse verb-framing patterns.’

- (63) il_F marche_M le long de la route_P [G inclusive].
 he *walks* *along* *the road.*
- (64) il_F court_M dans le jardin_P [G inclusive].
 he *runs* *into the garden.*
- (65) il_F court_M en traversant_P la route_G.
 he *runs* *crossing* *the road.*
- (66) il_F titube_M en allant vers_P le banc_G en arrière_P.
 he *staggers* *going towards* *the bench* *backwards.*

These patterns are considered ‘reverse’ verb-framing, as they allocate MANNER to the verb slot and PATH to the adjunctive phrase slot. In other words, they reverse the Talmyan verb-framing pattern of allocation of conceptual information to grammatical slots, so that the gerund or PP adjunct no longer encodes MANNER, but PATH instead. We suggest, additionally, a distinction between the reverse verb-framing construction using a PATH PP and the one using a gerund adjunct. Semantically, a gerund highlights the progression of a PATH, whereas a PP is more prone to a static description of a more locational nature. Furthermore, sentences using PATH PP adjuncts are more consistently acceptable to native judgements, whereas PATH gerunds yield ambiguous judgement responses (see below). This state of affairs may be due to at least two preliminary reasons, (a) PATH PPs mirror the motion activity pattern, which is widely acceptable in French, and (b) PATH gerunds remain atypical syntactically. In this sense, we may suggest that, though semantics is the primary licenser of grammatical acceptability of sentences, it is more likely that a combination of semantic validity together with syntactic typicality of pattern truly determines the optimal grammaticality of sentences.

Finally, the constructions in (67)-(69) display yet another type of available lexicalisation means for motion events in French. Often taken as MANNER verbs, the verbs in those examples actually differ from the verbs in (63)-(66), in that their semantic import additionally includes PATH information – besides MANNER information. In other words, the following sentences present verbs conflating both PATH and MANNER information in one lexical unit. Loosely speaking, the following constructions therefore conform to an extent to the Talmyan verb-framing pattern. However, by lexicalising MANNER information in an obligatory constituent, we suggest that these constructions differ from prototypical verb-framing as exemplified in (58)-(61), and constitute an independent hybrid conflation pattern (Kopecka 2004).

- (67) il_F plonge_{M+P}.
 he dives in.
- (68) il_F dévale_{M+P} les escaliers_G.
 he rushes down the stairs.
- (69) il_F claque_{M+P} la porte_G.
 he slams shut the door.

5.1.3.4. French Acceptability Judgements

The French elicitations yielded an unexpected range of variability beyond the Talmyan typology. The ensuing aim is to evaluate the reliability of these novel structures, in order to gauge the need for a re-assessment and potential revision of existing linguistic frameworks for motion encoding in French, and possibly in other languages too.

129 native French speakers⁶ were asked to provide judgements for these various patterns using a 1-5 scale of acceptability (see Appendix J). Below is a review of some of the patterns together with their percentages of acceptability.

The prototypical verb-framing pattern, so far largely considered as characteristic of the French lexicalisation pattern for motion, proved acceptable in some, yet not all, instances, as shown in examples (70) and (71). These examples triggered wide disagreement across speakers as to the grammaticality of the very patterns predicted as *the* way to encode motion in French, according to Talmy.

(70) PATH verb + MANNER PP

- | | | | | |
|-----------------------|-----------------------|--------------------------|--------------------------|----------------|
| a. Aline _F | traverse _P | la rivière _G | à la nage _M . | 92% acceptable |
| <i>Aline</i> | <i>crosses</i> | <i>the river</i> | <i>at a swim.</i> | |
| b. Marc _F | longe _P | le trottoir _G | à pied _M . | 55% acceptable |
| <i>Marc</i> | <i>goes along</i> | <i>the pavement</i> | <i>on foot.</i> | |

(71) PATH verb + MANNER gerund

- | | | | | |
|------------------------------|---------------------------|--------------------------|------------------------------|----------------|
| a. L'oiseau _F | est sorti _P | du nid _G | en sautillant _M . | 95% acceptable |
| <i>The bird</i> | <i>exited</i> | <i>the nest</i> | <i>hopping.</i> | |
| b. Titi _F | sort _P | de la cage _G | en volant _M . | 62% acceptable |
| <i>Tweetie</i> | <i>exits</i> | <i>its cage</i> | <i>flying.</i> | |
| c. Les abeilles _F | sont sorties _P | de la ruche _G | en volant _M . | 35% acceptable |
| <i>The bees</i> | <i>exited</i> | <i>the beehive</i> | <i>flying.</i> | |

⁶ Subjects included male and female speakers of differing ages, professions, and linguistic backgrounds. None of these factors correlated with the variability of judgements, hence the variability seems to be specifically linguistic.

d. Julie _F	est montée _P	dans l'arbre _G	en grimpant _M	35% acceptable
<i>Julie</i>	<i>went up</i>	<i>into the tree</i>	<i>climbing up.</i>	
e. Le bateau _F	est arrivé _P	au port _G	en navigant _M	0% acceptable
<i>The boat</i>	<i>arrived</i>	<i>in the harbour</i>	<i>sailing.</i>	

All the above sentences adopt the same structural organisation for the four central elements for motion expression. However, we can observe clear differences in acceptability rates, with sentences (70a) and (71a) as uncontroversially grammatical by native standards, (70b) and (71b) as ambiguous, and (71c) to (71e) as mostly ungrammatical.

We suggest that the main difference between these sentences is not grammatical in a typological sense, but semantic and pragmatic. Indeed, the sentences yielding ambiguous and ungrammatical readings appear to flout the Gricean maxim of quantity by adding MANNER information in an adjunctive phrase, when that information is already present – or at least implied – in the rest of the sentence, and in particular in the types of FIGURES in the examples above, except in (71e) where MANNER information is derivable from a combined reading of the FIGURE and of the GROUND. Compare, for instance, (71b) involving a bird exiting its cage, which would by default require a FLYING type of MANNER, with (71a) involving the same idea, but in which case a hopping type of MANNER no longer constitutes the default MANNER -of-motion for birds. By specifying the default FLYING type of MANNER, (71b) becomes semantically redundant – whereas (71a) does not and thus remains acceptable. It is equally interesting to compare (71b) with (71c), where (71c) clearly constitutes a poorly acceptable French sentence, whereas (71b) remains somewhat ambiguous. The FIGURE in (71c) is explicitly a FLYING AGENT, i.e. bees, whereas the FIGURE in (71b) is only culturally a FLYING AGENT, i.e. Tweetie. In other words, the cogniser has to know Tweetie to know that Tweetie is a bird, hence the latent ambiguity in judging this sentence – not found in judgements on (71c). In sum, the poorly rated sentences in the above examples are not structurally ungrammatical, but semantically ungrammatical.

Turning to the so-called ‘reverse verb-framing’ patterns, these unexpected constructions conflating the MANNER in the main verb of the sentence and PATH in an adjunctive – typically a gerund – phrase also yielded variability in acceptability rates, as illustrated in sentences (72a)-(72d) below.

(72) MANNER verb + PATH gerund

a. Le cheval _F	galope _P	en venant vers la prairie _{P [G inclusive]}	9% acceptable
<i>The horse</i>	<i>gallops</i>	<i>coming towards the meadow.</i>	
b. La barque _F	flotte _M	en s'approchant de la rive _{P [G inclusive]}	29% acceptable
<i>The boat</i>	<i>floats</i>	<i>nearing the bank.</i>	

c. Anne _F	court _M	en passant dans le parc _P [G inclusive].	55% acceptable
<i>Anne</i>	<i>runs</i>	<i>going through the park.</i>	
d. L'enfant _F	sautille _M	en allant à l'école _P [G inclusive].	80% acceptable
<i>The child</i>	<i>hops</i>	<i>going to school.</i>	

These judgements confirm the above suggestion that semantic redundancy, as encoded and implied in FIGURES and types of MANNER, leads to ungrammaticality. Indeed, default types of MANNER of motion include GALLOPING for horses, FLOATING for boats, and RUNNING – if not WALKING – for human agents. Again, the structural organisation alone of motion information does not suffice to determine sentence acceptability.

Finally, hybrid patterns conflating both PATH and MANNER into a single verb seemed to yield the least judgements of ungrammaticality and the least variability across native speakers.

(73) Hybrid PATH + MANNER verb

a. L'oiseau _F	s'est envolé _M	du nid _G .	100% acceptable
<i>The bird</i>	<i>flew out</i>	<i>of the nest.</i>	
b. Paul _F	a grimpé _M	dans l'arbre _G .	65% acceptable
<i>Paul</i>	<i>climbed up</i>	<i>in the tree.</i>	

5.1.3.5. Discussion of French Constructions

The data presented has so far demonstrated that though prototypical verb-framing may be the most widely used pattern for motion lexicalisation in French, numerous other patterns are available to describe motion. To summarise,

- i. either MANNER or PATH information may be framed in the main verb,
- ii. prepositional phrases are more typically used than gerunds to encode either MANNER or PATH as foregrounded information,
- iii. numerous French verbs encode both PATH and MANNER in one lexical entry, e.g. *grimper* (climb up), *s'enfuir* (run away), *écouler* (run out(wards)), *décoller* (take off), etc.

However, neither prototypical verb-framing, nor other patterns, are consistently judged grammatical:

- iv. ambiguous and ungrammatical judgements point to semantic redundancy rather than morphosyntactic licensing, i.e. French relies heavily on inference in motion expression and comprehension,
- v. MANNER inferencing relies on contextual and general knowledge, so that MANNER of motion may be perceived as conflated in the FIGURE (e.g. birds fly, pedestrians walk, boats sail), or in the GROUND (e.g. SWIMMING is likely to occur in bodies of water, and SKIING on snowed slopes).

Overall, taking into account the inferential nature of the French language and its ensuing lack of grammatical tolerance for semantic redundancy, we may now predict that sentences (76) to (78) are therefore ungrammatical.

- (74) le skieur_F a descendu_P la piste_G.
 the skier *went down* *the slope.*
- (75) il_F a descendu_P la piste de ski_G.
 he *went down* *the ski slope.*
- (76) * le skieur_F a descendu_P la piste de ski_G.
 the skier *went down* *the ski slope.*
- (77) * le skieur_F a descendu_P la piste_G en skiant_M.
 the skier *went down* *the slope* *skiing.*
- (78) * il_F a descendu_P la piste de ski_G en skiant_M.
 he *went down* *the ski slope* *skiing.*

This point is equally valid when adopting a reverse verb-framing structure, e.g.

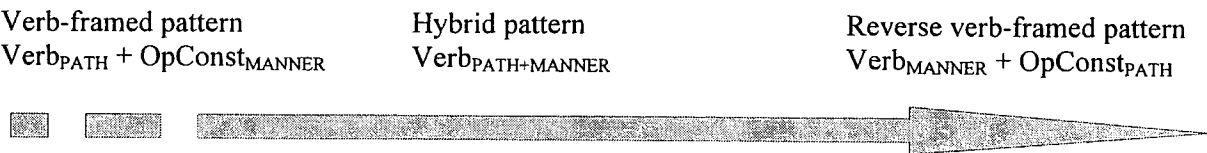
- (79) il_F a skié_M jusqu'en bas de la piste_{P+G}.
 he *skied* *all the way down the slope.*
- (80) * le skieur_F a skié_M jusqu'en bas de la piste_{P+G}.
 the skier *skied down* *all the way down the slope.*
- (81) * le skieur_F a skié_M jusqu'en bas de la piste de ski_{P+G}.
 the skier *skied down* *all the way down the ski slope.*

- vi. PATH-only verbs are few. Indeed, PATH types constitute a finite set which is likewise represented in language, e.g. *descendre* (DOWN), *monter* (UP), *entrer* (IN), *sortir* (OUT), *traverser*, *franchir* (ACROSS), *longer* (ALONG), *approcher* (TOWARDS), *éloigner* (AWAY), *partir*, *quitter* (FROM).
- vii. Most supposed PATH verbs in French hence include some degree of MANNER specification either explicitly or implicitly (by relying on inferences), and are hence hybrid semantic clusters including both PATH and MANNER information simultaneously.

In the light of this, the patterns recorded for French seem to fit along a continuum akin to Slobin's (2004) ranging from high degrees of PATH salience to high degrees of MANNER salience.

In other words, the whole continuum is represented within *one* language, such that

Figure 5.2. French motion constructions.



Path / Manner Salience

[+PATH/ - MANNER]	[+PATH/ + MANNER]		[-PATH/ + MANNER]
descendre...	tomber...	plonger...	courir...
go down	fall down	dive	run
monter ...	grimper ...	escalader ...	voler...
go up	climb up	rock-climb up	fly
entrer	pénétrer	s'infiltrer	envahir
enter	penetrate	infiltrate	invade
sortir	évacuer		stagger
exit	evacuate		
traverser			
cross			
longer	parcourir		
go along	run along		
approcher	accourir		
go near/ towards	run to(wards)		
s'éloigner, partir	s'évader	s'enfuir	
go away from	escape	flee	

Such a continuum relates verbal semantics to structural patterns and enables predictions to be made regarding pattern acceptability. At the [+PATH] end of the continuum, it is therefore possible to envisage MANNER information encoded in an optional constituent, typically in the form of a PP, or possibly in a gerund. At the [-PATH] end of the continuum, such MANNER encoding in an extra constituent would become superfluous, unless it specifies the MANNER with added semantic fine-graining, e.g.

- (82)
- | | | | |
|-----------------------|---------------------|------------------------------|----------------------------|
| l'enfant _F | marche _M | à quatre pattes _M | vers sa mère _P |
| <i>the child</i> | <i>walks</i> | <i>on all fours</i> | <i>towards his mother.</i> |

In this case, PATH information may be specified in an optional constituent – preferably, again, in a PP. As for hybrid verbs, they call forth a hybridised pattern, whereby additional information on either PATH or MANNER is unnecessary to specify the whole motion event. Considering the diversity of data obtained, the following set of patterns may thus be posited for French:

- (83) VERB-FRAMED PATTERN
- | | | | |
|---------------------------|----------------------|--------------------------|-----------------------------|
| Subject _{FIGURE} | Verb _{PATH} | Object _{GROUND} | (OpConst) _{MANNER} |
| Marie | monte | les escaliers | (en roller). |
| | | | (en boitant). |
| Mary | goes up | the stairs | (on her skates). |
| | | | (limping). |

(84) HYBRID PATTERN

Subject _{FIGURE}	Verb _{PATH+MANNER}	(OpConst) _{PATH+GR}
a. Marie	tombe	(à terre).
	bascule	(dans le vide).
<i>Mary</i>	<i>falls</i>	<i>(to the ground).</i>
	<i>sways</i>	<i>(in a chasm).</i>
b. L'avion	a atterri	(au sol).
<i>The plane</i>	<i>landed</i>	<i>(on the ground).</i>

(85) REVERSE VERB-FRAMED PATTERN

Subject _{FIGURE}	Verb _{MANNER}	(OpConst) _{PATH+GR}
Marie	court	(dans le jardin).
		(en montant la côte).
<i>Mary</i>	<i>runs</i>	<i>(into the garden).</i>
		<i>(going up the slope).</i>

Table 5.2. Summary of complex verbal patterns for motion expression in French.⁷

Pattern	Subject	Verb	Object	Optional Constituent
(a) Verb-framing	FIGURE	PATH	GROUND	MANNER
(b) Hybrid	FIGURE	PATH & MANNER		PATH & GROUND
(c) Reverse verb-framing	FIGURE	MANNER		PATH & GROUND

These patterns remain consistent so long as MANNER information is not already inferrable from the FIGURE as in (86), or from the GROUND as in (87), e.g.

(86) * Les piétons traversent la rue en marchant/ à pied.
The pedestrians crossed the street walking/ on foot.

(87) * Marie descend la piste de ski en skiant.
Mary went down the ski slope skiing.

Pattern preferences rank from (a) to (c) in French, hence showing a tendency towards PATH-loaded information.

5.1.3.6. Motion Activity vs. Motion Event

Part of the linguistic variability obtained in the French sample relates to the unexpected conflation of MANNER in the main verb of the sentence. In a number of instances, this pattern

⁷ The term ‘complex’ entails that verbs are either PATH- or MANNER-loaded semantically, that is, they are not neutral motion verbs, e.g. *aller* (go), *venir* (come). Verbal constructions using such verbs are not discussed here. However, it is worth noting that in both languages, the lexicalisation pattern is [neutral verb + (PATH satellite) + PATH PP + MANNER optional constituent], e.g. *he went to London on a horse/ il est allé à Londres à cheval*. Interestingly though, lexical patterns for either PATH- or MANNER-loaded information reach into idiomatic use with neutral verbs. It is common in English, for instance, to add (semantically superfluous) PATH information, e.g. *he went up/ down/ in/ over/ across to town*. Likewise, French prefers the use of PATH verbs for telic events, e.g. *je suis rentré dans la maison* (I entered the house) is favoured over *je suis allé dans la maison* (I went into the house).

further excludes PATH information, yielding an *activity*, rather than an *event*, reading of the motion in question. The semantic emphasis in an activity consists of the MANNER of motion as an end in itself, and further specifies a motion in progress. We suggest that it is relevant therefore to make a distinction between *motion activity* and *motion event* (as already mentioned above).

Unlike motion events, activities are essentially concerned with conveying information relating to the MANNER of motion. In other words, the core schema of an activity is no longer PATH, but MANNER, as in (88).

- (88) Marc_F court_M dans la rue_G.
Marc is running in the street.

The grammatical characteristics of an activity therefore differ crucially from those of a motion event in verb-framed languages, such as French, so that

- (i) MANNER information is now obligatory and is centrally encoded in the main verb of the sentence,
- (ii) PATH information is now optional and may be left unspecified altogether, and
- (iii) GROUND information is also optional and may be left unspecified as well, as in (89).

- (89) Marc_F court_M.
Marc is running.

Finally, it is relevant to note that a motion activity – through its de-emphasis on PATH – typically yields an atelic reading, so that there is neither endpoint being reached, nor boundary being crossed, nor result being achieved in the case of a caused motion.

On the other hand, as already pointed out, a motion *event* requires the elaboration of PATH information consistently, as PATH is its core schema, even in cases where MANNER of motion, and the fact that the motion is also in progress are relevant pieces of information. The grammatical characteristics of motion event encoding in French are therefore different to those of activity encoding, so that

- (iv) PATH information is obligatory and is centrally encoded in the main verb of the sentence,
- (v) GROUND information is, together with PATH, typically obligatory and thus encoded in a verb object or optional constituent directly following the verbal constituent, and
- (vi) MANNER information is now optional and may be left unspecified altogether, as in (91)-(92).

- (90) Marc_F monte_P les escaliers_G sur la pointe des pieds_M.
Marc goes up the stairs on tiptoes.

Finally, a motion event may receive either a telic or an atelic reading, depending on the nature of the PATH, so that an INTO event would be telic by definition as in (91), and an ALONG event would be atelic as in (92), e.g.

- (91) Marc_F est entré_P dans le jardin_G.
Marc entered (into) the garden.
- (92) Marc_F longe_P les bords de rivière_G.
Marc goes along the river banks.

An UPWARD event such as (90), on the other hand, may be either telic or atelic depending on context, e.g. whether the top of the staircase, in this instance, is reached or not.

The conceptual distinction between *activity* and *event* is evident regardless of the language. However, structurally speaking, it is blurred in satellite-framed languages such as English, as both types of motion – activity and event – are lexicalised conflating MANNER in the main verb. Note nonetheless that English too marks morphosyntactic distinctions between the two types of motion, as an event typically requires PATH to be encoded in a grammatical satellite as in (93), whereas an activity – no longer requiring a PATH – optionally lexicalises LOCATION in a preposition, typically together with the GROUND information in a PP instead, as in (94).

- (93) The mouse_F [ran_M under_P]_{VC} the table_G.
 (94) The mouse_F [is running_M]_{VC} under the table_{L+G}.

As (93) and (94) suggest, English further marks an aspectual distinction between the two types of semantic construals, using the progressive for activities to render the idea of motion-in-progress characteristic of activities. This distinction is also present in French via the variable use of tenses, e.g. the imperfect or present tense for activities, and the past perfect or the simple past (also called past historic) for completed motion events, e.g.

- (95) La souris_F [courut_M]_{VC} sous_P la table_G.
The mouse ran under the table.
- (96) La souris_F [courait_M]_{VC} sous la table_{L+G}.
The mouse was running under the table.

This latter point suggests that the distinction between activity and event is not solely one of emphasis on MANNER and PATH respectively. Fundamentally, the schema of TEMPORALITY is an integral part of defining CR types of motion in space, and this is reflected in aspect and tense forms used in the two languages at hand. This schematic property also explains a number of constraints on potential SR constructions – in both languages alike. Indeed, temporality enters the morphological make-up of main verbs, as seen above. As such, [+ PROGRESSIVE TEMPORALITY] verb forms encode activities in both languages, in which case English can no

longer afford satellites encoding TELIC PATHS, as these entail [- PROGRESSIVE TEMPORALITY], e.g.⁸

(97) ?*The mouse_F is running_M under_P.

(98) ?*The mouse_F is running_M out_P.

(99) The mouse_F is running_M along_P.

There is thus an obvious correlation between TELICITY and TEMPORALITY, in that TELICITY is not progressive, whereas ATELICITY implies some level of PROGRESSIVE TEMPORALITY. This has further implications for PATH verbs in both languages. Indeed, TELIC PATH verbs do not describe motion activities, and do not receive temporal morphology marking PROGRESSION, e.g.

(100) ?*Jack_F was entering_P the bedroom_G.

(101) ?*Jacques_F entrain_P dans la chambre_G.

Jack was entering (into) the bedroom.

Note again that the constraint applies similarly across both languages. This constraint is conceptual, and is thus reflected in the SRs of both language types. Furthermore, TELICITY seems to be temporally gradable, depending on whether it specifies the PATH GOAL, the SOURCE, or both, or the crossing of a boundary. Indeed, the crossing of a boundary is arguably more punctual, pointing either to the GOAL (e.g. IN), or the SOURCE (e.g. OUT). On the other hand, PATHS specifying both points (e.g. ACROSS) may be perceived as profiling the MEDIAN PATH, at least inferentially, and as such, they profile PROGRESSIVE TEMPORALITY to an extent. Note that this depends on the GROUNDS, nonetheless, as e.g. a field and a threshold do not require the same amount of time to cross. Depending on the GROUNDS, therefore, those PATHS may thus be marked semantically via temporal verb morphology, e.g.

(102) Jack_F was crossing_P the bridge_G.

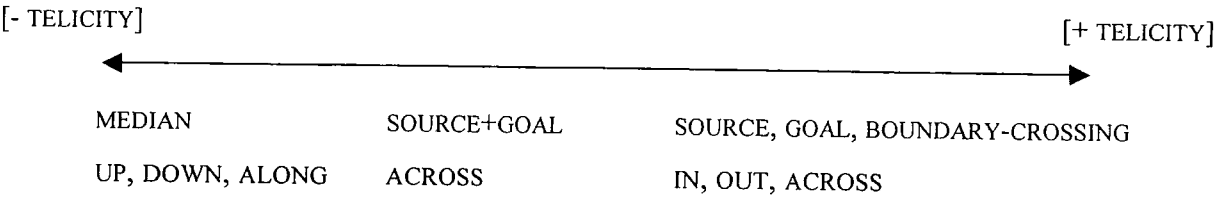
(103) Jacques_F traversait_P le pont_G.

Jack was crossing the bridge.

It may be relevant, therefore, to note that TELICITY is not absolute, but may range along a continuum, e.g.

⁸ Note that these English constructions are possible in live descriptions of motion activities involving goals, or endpoints. Common examples include sport commentaries, anticipating goals *during* the motion temporal progress, e.g. "the cyclist is reaching the finish line.. he's coming through the finish line now; he's going to cross the finish line any minute.. he's cycling across the line..he's crossing the line.. he's crossed the line! Let's watch him crossing that line again." In this case, TEMPORALITY is some sort of stretched present, in which motion is no longer time-dependent, but time becomes human-action-dependent. These are thus somewhat ad hoc cases – interesting though they may be.

Figure 5.3. Continuum of PATH TELICITY.



We may therefore conclude that TELICITY determines motion CRs, so that

- (a) absolute TELIC PATHS, e.g. BOUNDARY-CROSSING, GOAL PATHS, entail motion events only,
- (b) ambivalent TELIC PATHS, e.g. SOURCE+GOAL PATHS, entail either motion events or activities,
- (c) ATELIC PATHS, e.g. MEDIAN PATHS, entail either motion events or activities, and
- (d) LOCATIONS entail motion activities.

From here, we may additionally conclude that TELICITY determines motion SRs, so that, corresponding to (a)-(d) above

- (a) both languages may use a PATH verb with [- PROGRESSIVE TEMPORALITY] morphology, though English may also use a PATH satellite with a MANNER verb unmarked for PROGRESSION; yet, the more absolute the TELIC PATH, the less systematically MANNER information is expressed in either language;
- (b) both languages may use a PATH verb with [+/- PROGRESSIVE TEMPORALITY] morphology, though English may also use a PATH satellite with a MANNER verb marked or unmarked for PROGRESSION, depending on the level of TEMPORALITY relevant to the semantic intent;
- (c) French only may use a PATH verb with [+/- PROGRESSIVE TEMPORALITY] morphology, and English can only use a PATH satellite with a MANNER verb marked or unmarked for PROGRESSION, depending on the level of TEMPORALITY relevant to the semantic intent; and finally,
- (d) both languages may use a MANNER verb typically marked [+PROGRESSIVE TEMPORALITY], and LOCATION may be encoded in an optional PP.

Similar constraints therefore operate for both languages in their mapping of motion CRs onto local SRs. This is mainly true for activities (d), and for TELIC PATH events (a) and (b). In the case of atelic events (c), however, the two languages operate different constructions due to the non-use or non-existence in English of atelic lexical verbs. Indeed, a closer look at English PATH verbs reveals that TELIC types of PATH are as highly codable and idiomatic as they are in French, but that ATELIC PATH verbs in English are in complete disuse, whereas they are extensively common in French (see Table 5.3.).

Table 5.3. Common PATH verbs.

TELIC PATH schemas	French verb	English verb
INTO	Entrer	To enter
OUT	Sortir	To exit, to leave
ACROSS	Franchir, traverser	To cross
TO	Arriver, approcher	To arrive, to approach, to near
AWAY	Partir, quitter, s'éloigner	To leave
ATELIC PATH schemas	French verb	English verb
DOWN	Descendre	To descend
UP	Monter	To ascend
ALONG	Longer	None

As mentioned above, then, the temporal dynamics of motion in space are encoded in verb morphology. This brings the discussion to contemplate Talmy’s observation of verb-framed patterns encoding events following a [verb_{PATH} + gerund_{MANNER}] construction. Indeed, the gerund verb form entails [+PROGRESSIVE TEMPORALITY]. Hence, it leads to an activity reading of motion. Consider, e.g.

- (104) Jacques_F entra_P dans la maison_G en courant_M.
 Jack *entered* *(into) the house* *running*.

(104) does not entail that the FIGURE ran into the house, but that the FIGURE was running when he entered the house. Indeed, (104) encodes two construals characterising the motions of the FIGURE, namely an event, i.e. Jack entered the house, *and* an activity, i.e. Jack was running. This is different to the construal profiled in the following construction:

- (105) Jacques_F entra_P dans la maison_G à toute vitesse_M.
 Jack *entered* *(into) the house* *at great speed*.

In (105), the MANNER PP does not entail progressive temporality. Here, the PP does not characterise the FIGURE’s activity, rather it qualifies the motion event, that is, it qualifies the MANNER of the motion PATH. In (105), we no longer have two semantic construals following divergent temporality. Instead, we obtain one motion event as performed by the FIGURE.

This analysis highlights a few points. First, optional motion constituents in verb languages – and possibly in satellite languages too – cannot construe the same overall CR out of different grammatical categories. In the above examples, a gerund and a PP fundamentally profile different temporal schemas, and engender different semantic relations to the FIGURE, together with different construals overall. Second, the expression of one motion scene via two construals that are disparate in their temporal reality is unlikely to be the most linguistically and

cognitively economical means of motion description. This should be especially true of telic motion events; whereas in atelic events, the temporal perspective between the two construals may not be so discordant. This explains the scarcity of gerund constructions, such as (104), found in the French data. It also explains why gerunds are instinctively ‘heavy’ constituents, since they profile a separate construal, thus adding an extra information unit to the psycholinguistic processing of the sentence, and distracting the cognitive focus from a sole attention point. This further explains observations made in the literature concerning native preferences for creating separate clauses, e.g.

(106) Jacques_F est entré_P dans la maison_G et il_F courait_M comme un fou_M.
 Jack *entered* *(into) the house* *and* *he* *was running* *like a madman.*

(107) Jacques_F courait_M quand_G il_F est entré_P dans la maison_G.
 Jack *was running* *when* *he* *entered* *(into) the house.*

Finally, this analysis explains why French cannot afford the verb slot to MANNER so readily, whilst encoding PATH in a gerund instead, as TELIC PATHS cannot receive an activity reading without yielding semantic anomaly, e.g.

(108) *Jacques_F courut_M en entrant dans la maison_G.
 Jack *ran* *entering* *(into) the house.*

At the same time, this understanding offers a better account for similar patterns using a less TELIC PATH gerund, e.g.

(109) Il_F court_M en descendant_P les escaliers_G.
 He *is running* *descending* *the stairs.*

This type of sentence, as found in the data, again uses temporal morphology to mark PROGRESSION, on both verb forms. Yet, the initial emphasis is placed on MANNER via the main verb, as it duly profiles activities, as argued above.

Overall, the distinction between motion events and motion activities – together with the grammatical characterisations and constraints it generates – appears to require formalisation. This seems to be most obvious in the case of verb-framed languages, since activities typically frame MANNER in main verbs, whereas events frame PATH in main verbs. However, the present discussion has tried to argue that the distinction is equally relevant to satellite-framed languages, such as English. Crucially, the distinction is one of conceptual representation, and whether its mapping onto SRs is differentiated or not, a conceptual model of linguistic construals necessitates attention to CR divergences, relations, and dynamics. Therefore, contradicting Talmy (1985: 60), this approach contends that we *cannot*

treat a situation containing movement or the maintenance of a stationary location alike as a 'motion event'.

Indeed, verb-framed languages, such as French, appeal to two different typological strategies or construction types depending on the motion situation – event or activity; whilst English morphology is altered as a direct reflection of motion type. These possibly superficial artefacts have been shown to interact in productive ways, and to involve less obvious schemas, including TEMPORALITY and PATH TELICITY. Thus, whether a situation contains movement, or whether it is locational only has important consequences for its semantic elaboration in language.

5.1.3.7. PATH Mapping

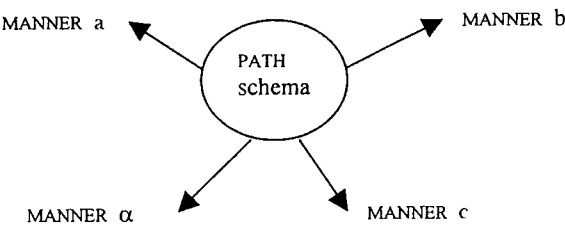
French appears to be more complex in its treatment of motion encoding than assumed in the literature. This complexity is partly due to the quantitative variability of means available to lexicalise motion events, as well as to the qualitative variability of those means in terms of acceptability.

Hence, a purely structural typology is not sufficient as a reliable index of motion lexicalisation in French; yet nor is Slobin's continuum according to which French should not have verbal slots available for the encoding of MANNER. In other words, there is no straightforwardly reliable recipe for the encoding of all motion events alike, and patterns are not predictable from morphosyntactic criteria alone.

Instead, the typological complexity illustrated above suggests that schematic, semantic and pragmatic factors must be integrated in descriptive accounts of motion grammar, as its typological dimensions.

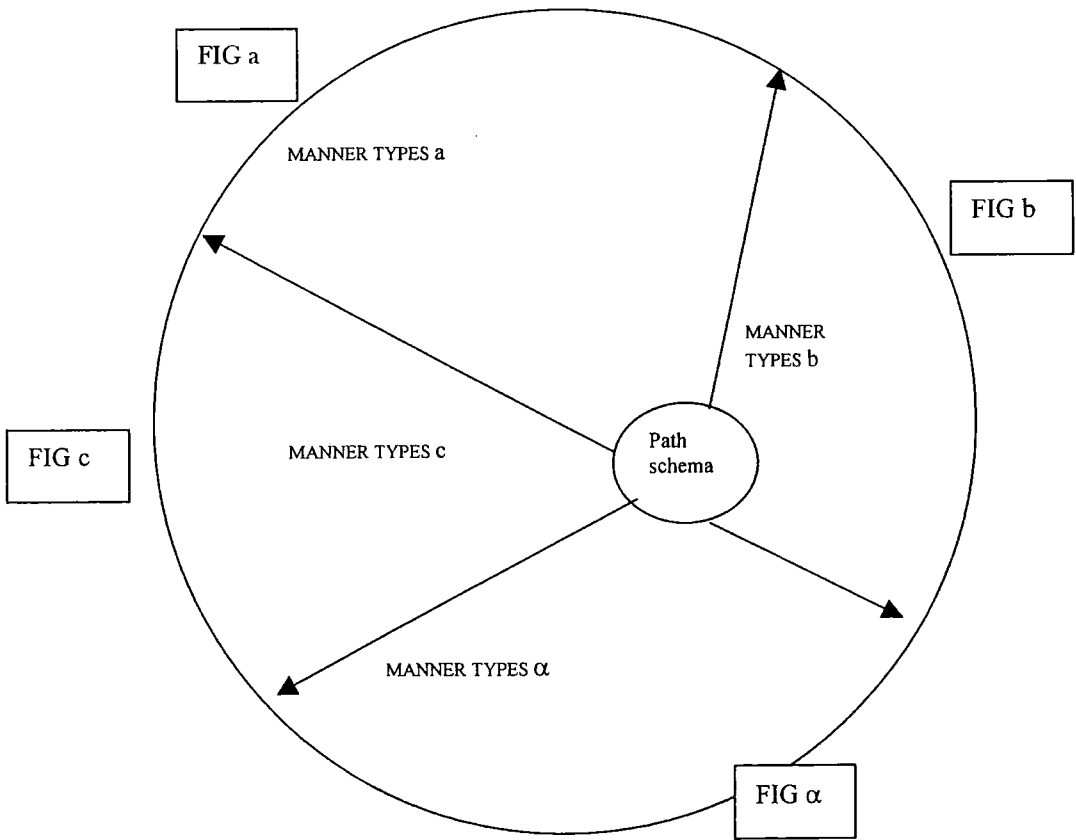
To adopt a conceptual approach, we must literally map the relevant CRs onto actual SRs. The central CRs thus far identified in the domain of motion are PATH, GROUND, TIME, MANNER, and FIGURE. Out of those five schemas, we may conflate PATH and GROUND together, as the one entails some specification *x* of the other – deictic or explicit. As the present focus is motion events, we may follow Talmy (1991) in positing PATH as the core schema. Given that motion events are PATH-centred, we therefore obtain a finite number of types of motion events, e.g. UP motion events, DOWN motion events, THROUGH motion events, INTO motion events, etc. Mapping types of motion events is thus feasible, quantitatively speaking. Adding a qualitative nature to the mapping involves incorporating the other schemas, e.g. MANNER (see Figure 5.4.).

Figure 5.4. Skeleton PATH map including PATH & MANNER.



Basically speaking, a motion event entails a type of PATH, e.g. UP, and the course of that PATH is followed implementing a particular MANNER of displacement, e.g. ROLLING, WALKING, FLYING. Those MANNER types may vary to significant extents. However, as the few examples above suggest, MANNER types may be constrained by the type of FIGURE in motion, e.g. ANIMATE, BIPEDAL, FLYING, etc. We can thus characterise the map more specifically, including the FIGURE schema (see Figure 5.5.).

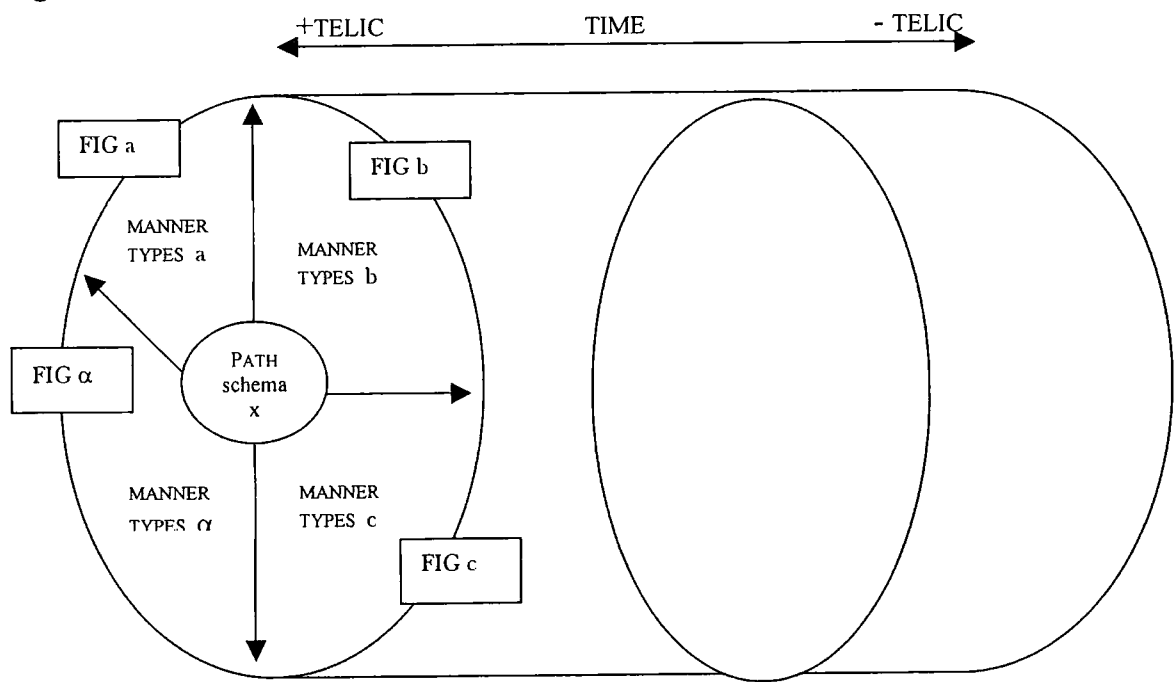
Figure 5.5. Skeleton PATH map including PATH, MANNER & FIGURE.



Conceptually, we can now regard Figure 5.5. as modelling motion generically – albeit in simple terms. When we apply a PATH CR to the core, e.g. INTO, it becomes evident, however, that this two-dimensional map can be productive only for that one PATH. To map another PATH, we need

to reproduce a new blank map. Indeed, as noted in the preceding section, PATH types determine other motion CRs (and SRs) relative to TELICITY. To obtain a more fully-integrative generic model, we thus need to add a third dimension, namely that of TIME (see Figure 5.6.).

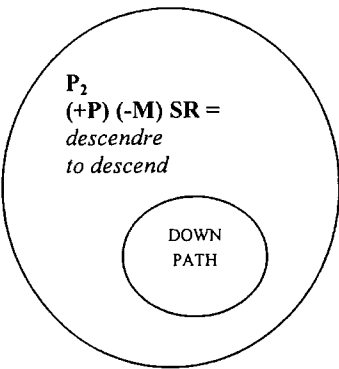
Figure 5.6. Skeleton PATH map including PATH, MANNER, FIGURE & TIME.



This model is analytical – rather than realistic. The cylinder may be conceptualised as a loaf of bread, comprising several slices, each slice – or PATH map – representing a motion type based on a given PATH schema. These maps range along a temporal continuum, highlighting [- PROGRESSIVE] at the [+ TELIC] end and [+ PROGRESSIVE] at the [- TELIC] end.

Now that the basic motion CRs have been outlined into a three-dimensional model, the following task consists of mapping those CRs onto SRs – here, in French and English. For this purpose, we will take one PATH ‘slice’ along the time axis and examine one motion type. Given that the two languages lexicalise motion SRs in verb complexes, the components of verb complexes are those that will receive greater attention in the mapping process. The verb in both French and English is one such component, whereas the satellite is used in English mainly. Therefore, the following mapping operations will consider the mapping of verbal semantics first.

Figure 5.7. Verbal SR mapping of DOWN PATH motion in P₂ space.



Closest to the conceptual core of motion, representations encode PATH maximally, with no MANNER elaboration (see Figure 5.7.). In the present DOWN motion type, the corresponding verb SRs are *descendre* in French and *to descend* in English. Because this space represents PATH maximally and MANNER minimally, we may call this space P₂.

At the sentence level, when PATH is maximally encoded, MANNER information is optional, unless it is semantically salient. This is true for both French and English. Note, however, that in atelic cases, such as in the present example, English seldom uses the P₂ space, that is, it seldom expresses PATH in the verb SR – as mentioned in the previous section. In P₂ space, MANNER is expressed using an optional constituent, such as a PP. The sentence construction in P₂ space is therefore [S_F + V_{P2} + O_G + OpC_M], e.g.

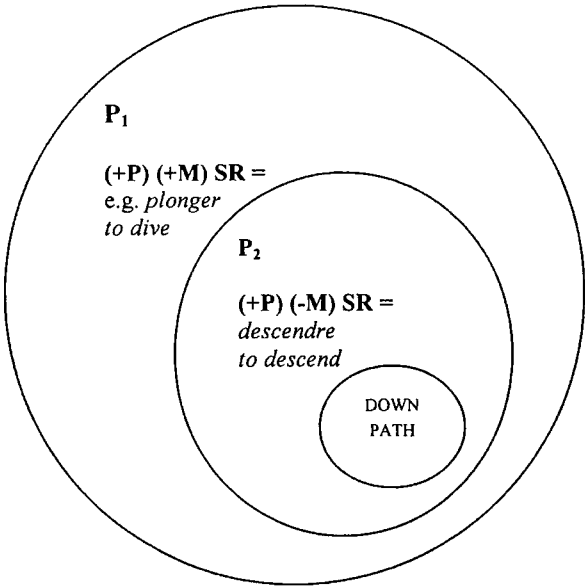
(110) Il a descendu les escaliers sur la pointe des pieds.
 He descended the stairs on tiptoes.

(111) Il franchit le seuil d'un bond.
 He crossed the threshold with a leap.

Note that this sentence construction is more typical in French than in English, especially for atelic motion types. English uses this construction more willingly in telic cases, though rarely with MANNER elaboration. In other words, French uses P₂ space to map motion CRs more commonly than English.

The representational space may be further specified as we distance away from the conceptual motion core. At this next level, we may configure representations encoding both PATH and MANNER information in one lexical verb. Because of the inclusion of MANNER information, we may posit that the verb profiles both concepts, and that the allocation of attention to the highlighted semantics is shared between the two schemas. As such, that attention is no longer maximally allocated to PATH. This space may be called P₁ accordingly (see Figure 5.8.).

Figure 5.8. Verbal SR mapping of DOWN PATH motion in P₁ & P₂ space.



In P₁ space, SRs offer many examples in French – what has been referred to as ‘hybrid’ verbs in preceding sections, and may also correspond to bipartite verbs in other languages. However, such SRs are possibly scarcer in English than in French, e.g. *dévaler* (to rush down), *dégringoler* (to tumble down), *chuter* (to collapse), *couler* (to sink). Interestingly, such verbs are more common for motion involving change of posture, rather than change of location, e.g. *s’accroupir* (to crouch), *s’agenouiller* (to kneel), *s’asseoir* (to sit), *se coucher* (to lie down), *se pencher* (to lean down). Such SRs are also found to encode other PATH CRs, such as UP, e.g. *décoller* (to take off), *grimper* (to climb up), *escalader* (to climb, to scale), or INTO, e.g. *insérer* (to insert), *pénétrer* (to penetrate), *envahir* (to invade), or OUT, e.g. *s’échapper* (to escape), *fuir* (to flee), or AWAY, e.g. *décamper* (to hurry away), and so on.

At the sentence level, P₁ space entails that MANNER and PATH are semantically represented in the verb. Therefore, MANNER no longer needs to be encoded in an optional constituent, unless extra MANNER information needs to be specified, e.g. SPEED, RATE, POSTURE, e.g.

- (112)

Le navire

a coulé

à pic.

The boat

sank

right down.
- (113)

L'enfant

s'assit

en tailleur / à califourchon.

The child

sat (down)

cross-legged/ astride.

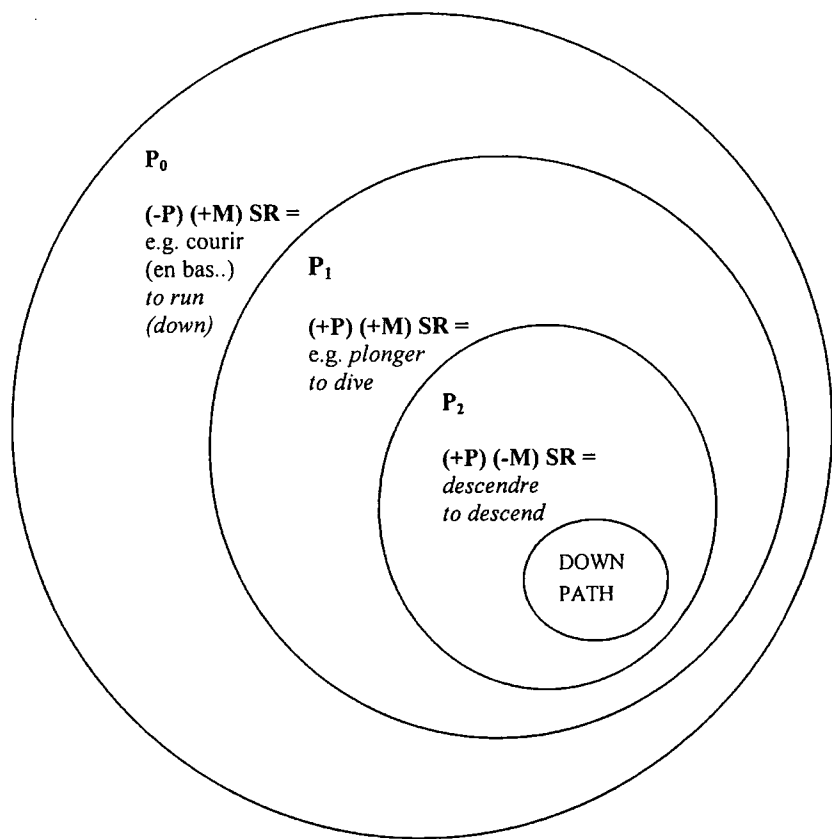
Sentence construction in P₁ space is therefore [S_F + V_{P1 (=P+M)} + O/OpC_G + OpC_M]. This construction is used in both languages alike according to the lexical resources available to encode both MANNER and PATH in one lexical verb. Note, however, that English may add PATH

information in superfluous, yet idiomatic, satellites, though this seems possible only with POSTURE verbs, e.g.

- (114) The child sat/ knelt/ crouched down on the floor.
- (115) *The boat sank down to the bottom of the sea.
- (116) *The lady collapsed down on the ground.
- (117) ?*The prisoners escaped/ fled out from the prison.
- (118) ?*The soldiers invaded/ penetrated in enemy territory.

Finally, we may specify the representational space further still. At an extra level of distance from the motion core, we may configure representations encoding PATH minimally and MANNER maximally. MANNER thus constitutes the sole CR mapped onto the verb SR. This space may be called P_0 accordingly (see Figure 5.9.).

Figure 5.9. Verbal SR mapping of DOWN PATH motion in P_0, P_1 & P_2 space.



In P_0 space, the verb SR does not encode PATH at all. Therefore, to retain a motion event SR, the addition of PATH information is realised in other grammatical categories, i.e. the satellite or, lacking this category, the optional constituent. In P_0 space, the construction of the sentence is thus preferentially $[S_F + V_{P_0} + Sat_P + O/OpC_G]$. Both languages are able to use the satellite pattern, though French does not have the same quantitative means for doing so. French retains a

few adverbs and locutions translating the satellite relation, e.g. *dedans (in)*, *dehors (out)*, *en aval (up)*, *en amont (up)*.

- (119) Obélix est tombé dedans quand il était petit.
 Obelix fell in when he was little.

However, these French SRs are mainly locational and thus fail to map PATH as such, so that they cannot encode the crossing of boundaries, e.g.

- (120) ?*Il courut/ trépigna dehors.
 He ran/ trampled out(side).

Predominantly then, the mapping of motion CRs onto SRs is realised differently in the two languages in P_0 space, as the satellite is largely a missing grammatical category in Romance languages. French may thus use an alternative option, lexicalising PATH information in optional constituents, i.e. $[S_F + V_{P_0} + OpC_{P+G}]$. This possibility is rarely available in telic motion events involving maximal TELICITY, e.g. BOUNDARY CROSSING, though it may be used in colloquial spoken French with highly codable MANNER verbs, such as *run*, *walk*, e.g.

- (121) Jean a couru dans la maison.
 John ran into the house.

- (122) ?*Sara a dansé dans la maison.
 Sara danced into the house.

In atelic motion events, however, this construction is more readily encodable, e.g.

- (123) Marc a couru le long de la rivière.
 Marc ran along the riverbanks.

This construction is mostly idiomatic in French when adding the PATH expression *tout* or *jusque* (*all the way*) profiling the PATH PROGRESSION, and emphasising its ATELICITY, e.g.

- (124) Il a couru jusqu'en bas (de la colline).
 He ran to the bottom (of the hill).

- (125) Il a trépiné tout le long (du chemin).
 He trampled all along (the way).

Finally, the optional constituent may also use a gerund, rather than a PP. As explained in the previous section, doing so profiles the addition of an activity, besides the event. It is somewhat atypical therefore to obtain a motion event construction using a MANNER verb, followed by an activity construction using a PATH gerund. However, it remains conceptually feasible if the main MANNER verb describes a completed event, which nevertheless followed PROGRESSIVE TEMPORALITY in its actual time slot, in which case its main PATH must have been atelic, e.g.

(126) Il a couru en descendant la colline.
 He ran descending the hill.

(127) *Il a couru en entrant dans la maison.
 He ran entering the house.

It remains that French MANNER-only verbs tend to profile activities, hence these constructions are atypical overall.

On the other hand, the satellite is a productive grammatical relation in English, and it entails that PATH information is part of the obligatory verb complex. This requires that the verb complex can provide rich and ready encodings of both MANNER and PATH, and economically so using only one constituent. This efficiency explains why P_0 space characterises most English constructions for motion events, e.g.

(128) The couple waltzed into/ out / across/ past/ around (of) the room.

(129) Mike jogged along/ up/ down/ under/ over the footbridge.

5.1.3.8. Summary

Overall, these maps show that the motion conceptual space may be delineated relative to PATH and MANNER specification, and that the sub-spaces identified may be mapped onto SRs following formulaic constructions, so that

P_2 space \rightarrow $[S_F + V_{P_2 (=P)} + O_G + OpC_M]$

P_1 space \rightarrow $[S_F + V_{P_1 (=P+M)} + O/ OpC_G + OpC_M]$

P_0 space \rightarrow $[S_F + V_{P_0 (=M)} + Sat_P + O/ OpC_M]$ or $[S_F + V_{P_0 (=M)} + OpC_{P+G}]$

Languages have been shown to prefer the selective use of given spaces rather than others. Thus, French lexicalises motion events using predominantly the P_2 space, e.g. (130), though it also uses P_1 extensively, e.g. (131). The usage of these two spaces applies to both telic and atelic motion types. French makes little use of the P_0 space, and when it does, it is mainly for atelic motion events, e.g. (132).

(130) FIG P_2 G (M)
 Marie entra dans la pièce (sur la pointe des pieds).
 Mary entered (in) the room (on tiptoes).

(131) FIG P_1 (P+G)
 l'avion a atterri (au sol).
 The plane landed (on the ground).

(132) FIG P_0 (P+G)
 La barque flotte (vers la rive).
 The boat floats (toward the bank).

Note that the above apply if and only if the MANNER information in the optional constituent is not inferrable from the FIGURE, PATH, or GROUND information present in the rest of the sentence (as discussed in preceding sections), e.g.

(133) ?*Marie monte les escaliers en marchant/ à pied.

Mary ascends the stairs walking/ on foot.

(134) ?*Marie descend la piste de ski en skiant.

Mary descends the ski slope skiing.

(135) ?*Les sirènes nagèrent jusqu'au bateau.

The mermaids swam to the boat.

English, on the other hand, lexicalises motion events using predominantly the P_0 space, e.g. (136), though it also uses P_1 extensively, e.g. (137). The usage of these two spaces applies to both telic and atelic motion types. English also makes use of the P_2 space, and when it does, it is mainly for telic motion events, e.g. (138).

(136) FIG P_0 P+G
The boat sailed to the bank

(137) FIG P_1 (P+G)
The plane landed (on the ground).

(138) FIG P_2 G (M)
Mary entered the room (on tiptoes)

Note that in boundary-crossing cases, English appears to prefer the P_2 space. Compare, e.g.

(139) a. Let's cross (the street).

b. Let's walk across (the street).

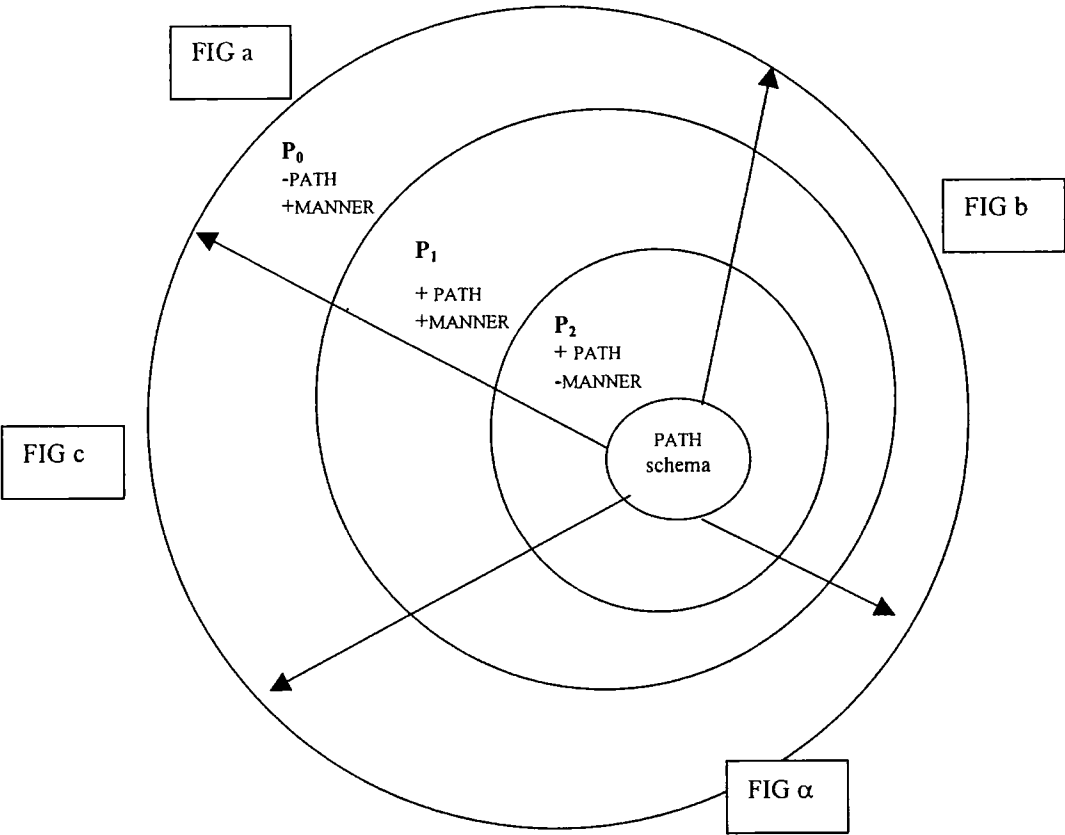
(140) a. Could you shut the window?

b. Could you push/ pull/ slide/ slam the window shut?

Overall then, the model has the advantage of conceptualising (a) motion CRs independently of SRs, and (b) the mapping of those CRs onto SRs of different languages in a single model. Indeed, according to the language data, we may posit that motion events are preferentially construed using the P_0 sub-space in English, and using the P_2 sub-space in French, though *all* three sub-spaces and their corresponding constructions are used by both languages. Furthermore, by integrating CRs and SR constructions into a single model, the PATH map is also able to account for seeming discrepancies in the language data, that is, constructions not predicted by a strictly binary typology such as Talmy's (e.g. 1985). In addition, by considering different conceptual sub-spaces and their corresponding SR constructions, the model necessitates a more

in-depth exploration and understanding of language-specific dynamics and constraints. The above discussion has attempted to provide such an understanding. The above modelling is thus hoped to be productive and to be able to generate all possible motion sentences in English and French.⁹ One such generic map may be represented as in Figure 5.10. Verbs from either language may then be plotted in each of the sub-spaces, relative to the FIGURE type.

Figure 5.10. Generic PATH map for verbal constructions of motion encoding.



Importantly, this lengthy section has confirmed that French and English typically express motion in language following different semantic mappings of the CRs available in the conceptual input. The aim of this linguistics section has been to establish the existence of such differences, and to appreciate their likely extent. Despite the apparent disagreements across possible models for motion linguistics, the three models reviewed – structural, discursive, and conceptual – converge in their conclusions regarding the Romance focus on PATH mappings to the detriment of MANNER renderings, and the Germanic preferences for the dynamic expression of both PATH and MANNER information. Given that the data reviewed confirm those preferential distinctions, it now becomes possible to elaborate relativistic predictions for language effects on

⁹ Except PATH- and MANNER-neutral verb constructs, which have not been discussed so far.

cognitive conceptualisation of motion events. The above section was nonetheless required in order to meet demands of rigorous linguistic analyses of domain encoding prior to experimental design and assessment of a psychological nature. In addition, it is hoped that the detailed conceptual model proposed in this chapter offers further innovative insights into novel approaches to linguistic theorising – regardless of the epistemological aims of application.

5.2. PREDICTIONS OF COGNITIVE SALIENCE

The above discussion and data presentation have been useful in establishing the patterns available in English and French for lexicalising motion schemas. These sections have illustrated that languages differ in what must be said and what may be left implicit. They make it possible to review the likely hypotheses one may derive from such patterns for relativistic effects on cognitive functioning. Psycholinguistic research on those lexicalisation patterns – as reviewed in Chapter 4 – has suggested that English speakers seem to assert actions and imply results, whereas Romance speakers seem to assert results and imply actions (Slobin 1996a: 84). It is a fallacy however to infer, on the basis of the different conflation patterns, that MANNER must be expressed in satellite-framed languages but not in verb-framed languages, and that PATH must be expressed in verb-framed languages but not in satellite-framed languages. Indeed, as noted by Choi & Bowerman (1991: 93):

In English it is often obligatory to spell out Path rather completely, even when it can be readily inferred from context.

English, in fact, requires both MANNER and PATH in the expression of motion. French on the other hand does not. French may leave MANNER out entirely, and does so to an almost systematic extent (e.g. Slobin 2000, 2003a). In fact, MANNER is conveyed only when relevant to arguments, as discussed above.

The research question which this study now wishes to address is thus whether the concept of MANNER is less salient to French speakers than to English speakers – due to the typical structural distribution of SR mappings of CRs and to the ensuing discourse practices operated by their languages. This research seeks to clarify whether the concepts of MANNER and PATH have differential cognitive salience for speakers of the different language types. In other words, the present study asks whether speakers of those two languages have developed different cognitive reflexes whereby they systematically and unconsciously conceptualise motion events in certain ways rather than others. By asking this question, this study is not suggesting that French speakers are in any way ‘deficient’ in their perception of MANNER of motion, simply because that schema is often left unexpressed in language. The question is not an absolute one, and

results are not expected to contrast in the absolute. A reasonable degree of objectivity advises us, as Slobin (2004: 237) notes, that indeed

verb-framing does not 'suppress' attention to Manner: Manner of motion is too important for human beings to ignore. However, people are led to focus on and elaborate Manner if they use a language with high codability in this domain.

Attention to MANNER of motion may be better considered, therefore, along a continuum of relative salience, so that English speakers may find MANNER of motion more salient than French speakers. In the event that the answer is positive, this research would ultimately suggest that cognitive perception, processing, and conceptualisation of motion are conditioned by the semantic construals elaborated by the idiosyncratic patterns of the language in question. Furthermore, by showing such effects of language on non-linguistic thought between two closely-related languages and cultures, it would also imply that these kinds of effects are likely to be found between other language groups and also possibly concerning different aspects of language and thought. In sum, positive results would support the linguistic relativity postulate suggested by Whorf and Sapir seventy years ago, according to which language influences thinking so that speakers of different languages perceive the same reality in differing ways.

The following sub-sections review different possible answers to this research question. The first two sub-sections detail predictions according to which linguistic patterns describing motion may influence the conceptualisation and/ or processing of motion events. These predictions are based on the understanding that the various linguistic practices and mappings described above engender differential cognitive salience for the semantic elements they encode. A third sub-section discusses an alternative position based on the non-relativist possibility that linguistic patterns do not exert any influence on non-linguistic thinking. Non-relativist predictions may entail universal or idiosyncratic tendencies for conceptualising motion. In the first case, all members of the species should perceive motion alike, regardless of their native language lexicalisation pattern; and in the second case, similar conceptualisation patterns across individuals would likely be accidental, and more probably they would not be observed at all.

Note that the concept of salience is referred to in a cognitive sense. The cognitive salience of an element in a context implies the relatively higher degree of attention that this element receives in comparison to that allocated to other elements equally present in the context. The factors responsible for the salience of an element are diverse, yet not necessarily arbitrary. It is the aim of this research to establish whether language may be one such factor in the distribution of salience.

This definition of salience is distinct from Talmy's notion of linguistic/ semantic salience (1985: 122), according to which,

The degree to which a component of meaning, due to its type of linguistic representation, emerges into the foreground of attention or, on the contrary, forms part of the semantic background where it attracts little direct attention.

To avoid confusion, Talmy's notion of linguistic salience will be referred to in terms of linguistic foregrounding versus backgrounding. Talmy's concept of salience is useful nonetheless in establishing the different types of predictions concerning cognitive salience likely to be engendered by SR mappings.

If we consider that linguistic elements may indeed impact on cognitive salience, two main predictions may be considered (Papafragou et al. 2002: 198). On the one hand, the information present in the obligatory verb complex may be viewed as emerging more in the foreground of attention than other constituents in the sentence (e.g. Slobin 1996, 2000). However, on the other hand, the verb complex may also be viewed as forming part of the semantic background, and therefore have a minimal impact on salience compared to other constituents in the sentence, by virtue of being obligatory, and hence unstressed (Talmy 1985). A third eventuality is to treat the dimension of PATH as the core schema of motion (e.g. Talmy 1991), and to expect therefore that the concept of PATH receives more salience than the concept of MANNER across subjects of different languages – as suggested already in section 5.1.2.1. All three approaches are detailed below along with their implications concerning predictions.

5.2.1. VERB COMPLEX SALIENCE

Psychologically speaking, Talmy's verb-complex-based typology for motion events is useful because the verb complex of a sentence bears not only functional salience in a linguistic sense, but also, potentially, psychological salience too. This assumption is based on the fact that speakers *must* use a verb complex when using language, and must therefore express the relevant semantic element(s) which their language requires them to encode in that verb complex. This naturally entails that speakers have to attend to the elements of motion whose encoding is obligatory in the verb complex of their language, whereas they need not pay attention to other elements which are optional or may be left unsaid altogether. Hence, it may be assumed that the semantic components expressed by the verb complex have more cognitive salience than the components expressed by other constituents in the sentence, such as adjunct phrases.

In the present context, French phrases expressing the MANNER of motion tend to be adjuncts in the expression of motion events – as thoroughly documented in the previous sections. In other words, French grammar may be said to render the MANNER of motion events

peripheral and dispensable, whereas English grammar renders MANNER salient and indispensable through its typical encoding in main verbs. This implies that the concept of MANNER may be more salient overall to English speakers than to French speakers. It may be argued, however, that PATH is as salient as MANNER to English speakers, as it is encoded in a satellite as part of the verb complex, and is therefore a compulsory piece of information for English speakers to map in language. Ultimately, the main differential across the two language types is the MANNER of motion, which Romance speakers are predicted to assess as less salient than English speakers, due to the fact that they do not *need* to attend to this conceptual feature in language.

What nonetheless remains unclear is which semantic element English speakers find more salient, i.e. the PATH as typically encoded by a satellite, or the MANNER as typically encoded by the main verb. Three types of prediction are possible for English speakers:

- (i) both elements are equally attended to so that there is no significant differential salience between PATH and MANNER, or
- (ii) the information encoded in the main verb is more closely attended to so that MANNER has more salience, or
- (iii) the information encoded in the satellite(s) is more closely attended to so that PATH has more salience.

5.2.2. VERB COMPLEX BACKGROUNDING

According to Talmy (1985), the reverse of the above suggestions is true. In other words, speakers' and hearers' attention is not focused on the information expressed by the verb complex, but on the contrary, on the information expressed by other surface elements in the sentence, e.g. a prepositional phrase. Talmy (1985: 122) proposes a universal principle of meaning foregrounding:

Other things being equal (such as a constituent's degree of stress or its position in the sentence), a semantic element is backgrounded by expression in the main verb root or in any closed-class element (including a satellite – hence, anywhere in the verb complex). Elsewhere it is foregrounded.

An example of this phenomenon is given in Talmy (1985: 122):

(141) Last year I went to Hawaii by plane.

(142) Last year I flew to Hawaii.

(142) corresponds to the typical lexicalisation of the English motion verb complex, comprising both the MANNER and the PATH of the event. In (141), however, the MANNER has been foregrounded in an adjunctive PP, i.e. outside of the obligatory verb complex. Though both sentences essentially mean the same thing, a perspectival contrast may be observed as a result of

the different mapping allocations used, whereby the MANNER of motion is 'pivotal' in (141) whereas it is 'incidental' in (142) (Talmy 1985: 122).

Talmy's principle of meaning foregrounding entails that the concept of MANNER of motion would be less salient to English speakers than to French speakers, as French foregrounds MANNER in adjuncts with a higher frequency than English. Indeed, English typically backgrounds MANNER in the sentence verb complex. It appears, therefore, that in English, both the MANNER and the PATH of motion are backgrounded pieces of information.

Again, what remains unclear in the case of English is the likely degree of cognitive salience of PATH versus MANNER for native speakers. The same three types of prediction as formulated above may be suggested. In other words, salience is only predictable in the case of Romance languages, regardless of the approach adopted with regards to verb-complex-based or foregrounded meaning-based predictions.

Finally, it is worth mentioning that Talmy's principle of semantic salience constitutes a linguistic analysis. In other words, the psychological salience of foregrounded meaning is relevant in the processing of language, but Talmy does not claim that this is also the case when processing motion events that are not linguistically encoded – but, for instance, are only visually processed. Hence, so far as the present study deals with the conceptualisation of motion in cognition, but not in language, Talmy's approach may not prove relevant and the predictions derived from his linguistic analysis may not apply to the type of cognitive behaviour examined in this study.

5.2.3. PATH SALIENCE

It may finally be hypothesised that all individuals conceive of PATH as the most salient CR in motion events, regardless of linguistic typologies. This suggestion has been made by Aske (1989) and Talmy (1991) – as detailed in 5.1.2.1. Aske (1989:9) exemplifies the fact that it is often the PATH (hence the satellite – not the main verb in English) which qualifies the sentence as reporting an actual motion, e.g.

(143) We squeezed through the crack

He then suggests that

it is the Path non-verbal predicate, and not an abstract MOTION component of the main verb, that contributes the motion sense of the construction (*ibid.*).

Talmy's and Aske's position on PATH as representing the core meaning of a motion event has further met Slobin's agreement:

The essence of a motion is change of location – in Talmy's terms, *path* (Slobin 2003a: 161-2).

He also later (2003b) claims that

Without a path verb or satellite or other path element, there is no motion event.

Despite the typological reality that satellite-framed languages give MANNER linguistic emphasis, generating more developed MANNER verb lexicons, particular discourse structures and fashions of thinking for speaking, the above argument suggests that PATH may be conceptually the most critical element in motion. If this is the case, we may expect speakers of both verb-framed and satellite-framed languages to perform similarly on non-linguistic tasks assessing dimensional salience in motion events. Responses should equally favour PATH as the most salient element of motion. If this were the case, the scope of relativistic effects may be limited.

Another source of support for the possibility of the overall salience of PATH comes from first language acquisition studies. It has been found that children use PATH expressions before they use MANNER expressions. In English, for instance, PATH words such as *down*, *up*, *in*, *out*, *back* are used extensively and exclusively as single-word utterances to convey motion (Choi & Bowerman 1991: 96). Basic MANNER verbs appear soon after, between fourteen and eighteen months, and by nineteen months, combinations of both PATH and MANNER expressions are employed along with conflation patterns. This delay in the acquisition of MANNER expressions may be indicative of some form of semantic or conceptual salience of PATH in motion. Though of course, it could also indicate some conceptual complexity of MANNER as compared to PATH, which infants may at first find harder to process and produce. In other words, this delay may be explained in terms of the greater salience of PATH, or in terms of the greater ease to process PATH in motion.

Finally, it is worth noting that there are no languages that do not express PATH, though there exist languages that cannot express MANNER. This optionality of the linguistic encoding of the concept of MANNER but not of the concept of PATH is also likely evidence that PATH is more central to characterising motion than is MANNER.

5.3. SUMMARY

This chapter has offered a detailed exploration of the chosen domain for investigation, namely motion. It has attempted to characterise the components of this domain independently from language. The crucial schematic components identified consist of FIGURE, GROUND, PATH and MANNER; though additional ones were also outlined, e.g. POLARITY, SOURCE, TRAJECTORY, GOAL, CAUSE, and RESULT. This presentation was followed by a discussion of the linguistic

patterning of those CRs in various languages, with special reference to French and English. Three frameworks of linguistic description were reviewed for this purpose, starting with Talmy's famous structural typology, differentiating French from English on the basis that the former frames the core PATH schema in main verbs, whereas the latter frames it in verbal satellites. Talmy's framework is useful in providing a clear and simple formula for motion encoding at the sentence level. Importantly, it has shown that FIGURES and PATHS (together with their GROUNDS) are essential in conveying the crux of motion events, meaning that MANNER is a peripheral CR in characterising motion events. This is exemplified clearly in verb-framing languages, such as French, which leave that CR typically unmapped onto semantic construals.

These essential structural differences have been exploited by Slobin in his empirical research, extending those sentence-level patterns to discursive tendencies overall. Slobin's work complements Talmy's in adding extensive considerations to lexical resources and their codability, and to supra-sentence-level fashions of speaking. In doing so, Slobin is characterising more than linguistic patterns; instead, he is characterising whole languages – at least insofar as the pervasive expression of motion is concerned. At this level, analyses are no longer clear and simple, which has led Slobin to challenge the potentially simplistic notion of a bipartite typology for motion encoding. Instead, he has suggested a continuum of CR salience as represented in SR mappings across languages, so that English would be situated at the [+] pole of MANNER CR salience in comparison to Romance languages, such as French – which would be at the [-] end of the continuum.

Both frameworks, however, were criticised for their lack of comparability in terms of language data. Indeed, Talmy's ideas were shown to be accurate as tendencies, but they fail to account for a number of patterns occurring in verb-framed languages, for instance. In other words, the typology is too formulaic and, thus, narrow in its applicability. On the other hand, Slobin's cline demands the characterisation of individual languages prior to their calibration within the cline – hence it remains difficult to apply as an analytical template. Furthermore, both frameworks depart from language SRs, rather than from domain CRs – meaning that some schemas may potentially be overlooked. In addition, given linguistic idiosyncracies, such a departure renders the analyst's work possibly more difficult and less easy to generalise overall. It was thus suggested that a third framework may be possible, namely one departing from motion CRs. This conceptual modelling of the semantic mapping of CRs in languages represents the innovative contribution of this chapter. The model reviews empirical linguistic data from both French and English to check its applicability. The conceptual model follows previous agreement on the centrality of the PATH schema and places the schema at the core of its domain

mapping, from which it elaborates the specificity of MANNER types based on FIGURE restrictions. Finally, it adds a temporal axis to allow for the durative dynamics of motion events. From this schematic template, it plots the SRs available in English and French to evaluate the variable use of the schematic maps by each language. The model is able to derive formulae of several types for both languages to account for the various possible patterns found in the data. The model further incorporates pragmatic constraints by sub-dividing the representational space for CR and SR types. In short, the model is economical at the same time as being representative of various CRs and their specificities. Further, the model is finite, by virtue of being conceptually based on PATH types, and applies equally to any language – which, by necessity, elaborates its semantic construals on possible conceptual forms.

This first section thus offered a thorough and original study into motion linguistics. Its primary aim was to satisfy epistemological rigour of investigation, via diverse empirical data collection together with a critical review of the literature insights into the topic at hand. The point was not so much to undermine the validity of those insights, as to suggest the need for systematic cross-referencing of empirical conclusions, as language-specific construals are by definition idiosyncratic and complex. This requirement is also driven by a wish to render the relativistic predictions for psychological assessment language-data-proof. Indeed, as past research has shown (see e.g. section 2.3.), relativistic conclusions often come into question when such thorough linguistic analyses have been overlooked. In addition, this thorough investigation further fulfills the inter-disciplinary and holistic endeavours inherent in this thesis, by offering facts of a purely linguistic nature, prior to pursuing studies of a more cognitive nature.

Hence, from this thorough review of possible frameworks for the expression of motion in language, the chapter has concluded with an outline of the predictions one may now draw for the application of these linguistic characteristics to relativistic hypotheses with regards the domain of motion. The thorough overview of data transparent in this chapter has indeed established that French and English construe differing semantic perspectives out of the motion domain, with French emphasising PATHS and their endpoints, whilst English stresses the continuity and dynamism of motion events via the mapping of MANNERS and DURATION, for instance. The predictions reviewed include two language-based types of hypotheses, and a schema-based hypothesis. The language-based predictions examine the distribution of SRs within obligatory and optional constituents to elaborate potential cognitive salience of their corresponding CRs – either obligatory constituents map the most cognitively salient CRs, or optional constituents map those CRs by virtue of their semantic foregrounding. Finally, it is possible that neither of these

possibilities is representative of conceptualisation, in that the core PATH schema of motion may simply override the importance of SRs in motion conceptualisation. In this case, regardless of the native language mappings, PATH defines the most cognitively salient schema in cognising motion. It is the aim of the third section and its three constitutive chapters to elucidate the reliability of these predictions via the implementation of experimental studies on various cognitive functions with both French and English subjects.

PART 3. LINGUISTIC RELATIVITY & MOTION: EMPIRICAL STUDY

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CHAPTER 6. MOTION IN LANGUAGE & COGNITION: CATEGORISATION

This chapter, together with the following two chapters, comprises the final part of this thesis, by turning to experimental applications of linguistic relativity in the domain of motion across native French and English speaking sample populations.

This chapter presents early tests on categorisation. Two main experimental formats were used – one with and one without the use of and interference from language elicitations. Categorisation was assessed with triads of motion videos. Full methodological details are presented in Section 6.1. Sections 6.2. to 6.5. review both the pilot and the main studies and present all the results obtained with the English and French speaking subjects. Results are analysed for responses obtained for each stimuli set, i.e. item set analyses, and for responses obtained for each subject, i.e. individual performance analyses. Linguistic data analyses are also presented for the second experiments. Finally, results for experiments 1 and 2 are compared for each language group study, in sections 6.3.4. and 6.4.4., and results across the language groups samples are compared in section 6.5.

6.1. METHODOLOGY

The present work pertains to experimental cognitive psychology, involving experiments and research using ‘normal’ subjects, i.e. adults with no known linguistic or cognitive impairment capable of impacting on test responses. There are three main methods for the assessment of cognitive activity, namely the study of behaviour (in experimental or naturalistic conditions), introspection by the subjects on some aspect of their behaviour, and the direct measurement of brain activity via various means (Eysenck & Keane, 1997: 19). This study will make use of the first two methods of inquiry.

More specifically, this section presents two experimental formats for the relativistic study of motion. In both experiments, the stimuli are visual, i.e. silent televised video clips. Experiment 1 consists of a cognitive task in the form of similarity judgements, thus involving vision and associative reasoning, but no linguistic interaction. Experiment 2, on the other hand, consists of two tasks, a linguistic description followed by the similarity judgements just described in experiment 1. Both experiments used two separate samples of subjects. The aim is to assess whether cognitive behaviour is concordant with linguistic patterns *without* relying on

linguistic expression itself, and to monitor the effects of explicit language on the same type of behaviour.

6.1.1. COMPARATIVE EPISTEMOLOGY

The necessity of comparing different languages and different speakers' performances has been discussed in 3.2.1.3. This study compares data obtained from a sample of native English speakers and native French speakers. The present choice of the French and English languages and their respective speakers was driven by three main considerations:

- (a) the researcher's fluency in both languages – a pre-requisite for establishing differences in linguistic patterns, and equally for ease of experimental implementation, e.g. instructing subjects, translating forms,
- (b) the crucial differences existing across the two languages in their lexicalisation of motion events at the syntactic, lexical, and overall semantic levels, and
- (c) the argument that if linguistic relativity is to see the day as a valid theory, the data ought to be drawn not only from extremely divergent languages, but also, and more potently perhaps, from closely-related languages (mentioned in 3.2.1.6.).

6.1.2. PARTICIPANTS

Twenty-two English native speakers took part in the pilot study. In addition, sixty-four English native speakers and seventy-five French native speakers were used as subjects in the main study. These numbers correlate with the minimum numbers of subjects used in similar studies, e.g. 31 subjects of each language in Naigles & Terrazas (1998), 47 and 46 subjects in Gennari et al. (2002), 43 and 34 in Papafragou et al. (2002).

Despite these communities living in largely monolingual environments, the monolingual requirement proved difficult to meet, given that the primary desire was to obtain either type of subjects with ease for quantitative purposes. Indeed, both communities followed secondary education entailing learning an Indo-European second language, typically German, Spanish or French. As a result, subjects were required to specify their knowledge of other languages, and were categorised accordingly. This categorisation enabled the testing of language effects from extra languages. Suffice it to say that all subjects used either English or French predominantly in their daily affairs. Only a minority of participants considered themselves fluent in a language following the opposite lexicalisation pattern for motion events from their native language. Subjects' linguistic profiles and the influence of their extra linguistic knowledge on their

performance in the tests will be discussed in greater detail when examining the experimental results.

The sampling procedure may nonetheless be considered valid 'attribute sampling',¹ as all subjects had to fulfil the criterion of having either English or French as their native language. Most subjects were university students of ages ranging between 18-22, with varying backgrounds and specialities. The subject sample also included three school children (past the critical period, i.e. over the age of 8), and a few adult members of the community including unemployed, employed and retired people. Age and occupation were monitored and were not found to diverge from the mainstream findings.

Finally, subjects were divided into two experimental groups in order to satisfy the two experimental formats administered. Participants were randomly allocated to either Group 1 ($N_E=34$, $N_F=35$) or Group 2 ($N_E=30$, $N_F=40$). These two groups were unrelated, in that no participant took part in both experimental formats. The subject sample may therefore be considered to fulfil the vital randomisation criterion for psychological testing (Leach 1991, Howitt & Cramer 2000).

6.1.3. ETHICAL CONSIDERATIONS

Research ethics are the broad moral principles and rules of conduct that guide psychologists when doing their research (Howitt & Cramer 2000: 21).

Ethical considerations must be attended to in any research involving human or animal participants. The present research has received approval from the Ethics Committee of the University of Durham. These considerations aim primarily at protecting subjects from psychological or physical harm, and at protecting the investigator from unjust accusations of bad conduct and misrepresentation. The experiments were accordingly conducted with great care regarding the subjects involved. First, participation was entirely voluntary and anonymous. No volunteer was discriminated against during the selection procedure, and all volunteers were therefore invited to participate. Subjects were also informed that they could end their participation at any time if they wanted. Subjects were duly asked to sign a consent form (see Appendix A) thereby acknowledging their voluntary participation in the experiment, and their understanding of the task and of the academic area to which they contributed. They were informed of the anonymity and confidentiality of the test, as well as of the fact that they could

¹ 'Attribute sampling' refers to a "method of selecting people for an experiment according to a particular attribute which they possess. This attribute may be one of experimental relevance or of experimenter convenience" (Leach 1991: 35).

resume their participation at any time. Finally, subjects were given the name and affiliation of the researcher.

Tests never exceeded 45 minutes in duration – in fact, they typically lasted between 20 and 30 minutes. When possible, participation was rewarded financially. The tests were not believed to engender undesirable side-effects or sources of discomfort. The only side-effect might have been a slight headache in the case where the subject may not be used to watching on-screen (television or computer) animations. Care was always taken to adjust the brightness, colour intensity, and light to the satisfaction of the subjects. Regarding sources of discomfort, it is possible that some subjects felt a certain degree of anxiety and tension related to the testing environment, e.g. the experiment itself, other subjects in the room, lack of familiarity with the building and/ or with the researcher herself. In order to minimise these levels of anxiety, subjects were always encouraged to bring friends to the experiment, and the researcher made every effort to ensure a friendly and relaxed atmosphere.

6.1.4. STIMULI

6.1.4.1. Types

The stimuli were non-linguistic, so as not to bias subjects' performance during the task at hand. In order to represent motion events, visual stimuli in the form of video clips were considered ideal, since by their animate nature they render the dynamicity inherent in motion more realistically than static pictures in a book for instance (e.g. Slobin 1996a, Papafragou et al. 2002). The use of static pictures such as drawings or photos (even in a sequence) may further result in a failure to elicit the type of performance desired, be it linguistic or cognitive (cf. Papafragou et al. 2002: 206). Videotaped stimuli have also been used successfully in similar studies (e.g. Naigles & Terrazas 1998, Gennari et al. 2002) and are now widely favoured in task-based research on motion events (Slobin 2003b).

The stimuli in this experiment consisted of silent colour video clips displaying short and simple motion events on a colour television monitor. The video clips were organised in sets of three. Eleven sets were used in the pilot study and fifteen sets in the main study (see Appendices B and C). The main study stimuli sets displayed the contrasts shown in Table 6.1.

Table 6.1. Stimuli types in the main study.

Triad set	Motion type	PATH	MANNER	GROUND
1	Caused	Open – shut	Push – pull	Door
2	Actual	Up – down	Walk – tiptoe	Staircase
3	Actual	Along – across	Walk – run	Road
4	Caused	Off – on	Switch – blow	N/a
5	Actual	Along – across	Run – cycle	Road
6	Actual	Down – along	Run – scooter	Stairs/ pool/ road
7	Actual	Up – down	Walk – cycle	Hill
8	Actual	In – out	Walk – run	House
9	Actual	Along – across	Walk – run	Road
10	Actual	Away – towards	Walk – limp	Person
11	Caused	Open – shut	Push – kick	Door
12	Actual	In – out	Dive – climb	Pool
13	Actual	Hello – bye	Wave – kiss	Person
14	Caused	In – out	Throw – pick	Sink
15	Caused	Under – out	Push – kick	Sofa

Before each motion scene, a blackboard displaying the set number and the item letter of the specific motion to be viewed appeared on the screen, e.g.

- Set [11] A a man kicks a door shut
 B a man kicks a door open
 C a man pushes a door open

The sets of stimuli were presented in a random order, as were the video items within each set. In other words, the (A) item in each set did not represent the target item nor did the (B) and (C) items represent two alternates, as is illustrated in set [11]. A couple of sets also repeated the motion scenes shown in different sets, but in a different order of display, in order to test for effects of order of presentation. Statistically, there were three possible pairs to choose from: (i) a MANNER pair, e.g. [11A] and [11B]; (ii) a PATH pair, e.g. [11B] and [11C]; and (iii) an ‘impossible’ pair displaying neither MANNER similarity nor PATH similarity, e.g. [11A] and [11C]. Instructing subjects that three statistical pairs were possible gave them the option to choose the ‘impossible’ pair, in which case it would be apparent that subjects were not attending to features of PATH and MANNER in the stimuli but to some other feature of relative importance. In other words, these pairs would likely reveal design flaws in the stimuli, and hence help the monitoring of stimuli quality.

Note also that different types of motion were represented in the test, including actual and caused motion events, as well as telic and locative motion events. The relevance of these differences will be fully analysed and discussed in Chapter 7.

6.1.4.2. Design²

In each set of video clips, it was ensured that the same person performed each action. It was further ensured that the actor or actress wore the same clothing in each scene. In each set, the props and settings are either the same in all three instances, or all different. In other words, the FIGURE and GROUND are constant in each set, so that they may not be treated as potential association factors. These decisions were driven by a wish to ensure that subjects' attention would not get distracted away from the phenomenon under study, namely the PATH and the MANNER of the motion events being displayed (e.g. no set displays a staircase in two video clips, and a garden in a third video clip).

6.1.4.3. Quality Assurance

Linguistic monitoring of the silent video clips was carried out in both languages by speakers who had not been briefed on the study (see Appendix D). They were individually instructed to describe what they were seeing on the television screen. The purpose of such linguistic monitoring was purely methodological, i.e. for the sake of quality assurance. Designing the video clips was an act of translation from a given linguistic pattern into visual material. The linguistic monitoring enabled a back-translation from the visual material into language. The main point was therefore to ensure that the second act of translation matched the initial one, so that anyone watching the video clips would interpret their visual content as intended. When monitors' descriptions failed to match the intended visual content, the video clips were carefully re-made and re-tested. Finally, having English and French speakers translating the visual content of the video clips back into natural language was insightful as it provided preliminary confirmation of the lexicalisation patterns of motion events in both languages.³

The experiment was run as a pilot study with twenty-two English native speakers, prior to the main tests. This 'throw-away' study was very useful in establishing experimental anomalies, and ensuring the administrative and operational feasibility of the experiments. This study also provided initial data and discussion points. Perhaps the most important contribution from this pilot scheme was the variability observed in the results, and the ensuing realisation that more

² For reference, the video clips were filmed in 2000 on Tenerife Island (Spain), using one adult male actor and one adult female actress; and in 2001 and 2002 in Durham City (UK), using another adult male actor. The equipment used consisted of a Panasonic VHS-C Movie Camera NV-S20 Palmcorder, and JVC VHS-C compact video cassettes. The films on the compact video cassettes were transferred onto JVC VHS video cassettes, for ease of display on traditional video machines. Except for the tapes, all the equipment, including the Palmcorder, the video recorders, and televisions were kindly provided by the School of Linguistics & Language, University of Durham.

³ Note that this kind of performance was what Slobin (e.g. 1996a) used as data, whereas here it merely serves quality assurance purposes.

experimental formats were needed in order to ensure some understanding of the final data. These various formats are outlined in the following section.

6.1.5. TASK PROCEDURE

6.1.5.1. Similarity Judgement: Experiment 1

For each set of stimuli, subjects were asked to associate two video clips out of the three shown in terms of similarity – thus leaving one video clip as the odd one out of the three – using the number and letter code corresponding to the chosen video clips, e.g. [5B] and [5C]; [13A] and [13B].⁴ The task was therefore essentially a forced choice between two alternatives: (i) a pair showing two items similar in PATH, or (ii) a pair showing two items similar in MANNER.⁵ However, subjects were instructed that if any choice of item pair were not satisfactory, then they should abstain from making a choice altogether – thereby leaving the relevant space blank or making a note such as ‘cannot decide’.

6.1.5.2. Experiment 2

In this experimental format, subjects were asked to depict the stimuli prior to making their association choices.⁶ In other words, this format involved the elicitation of written linguistic descriptions, and hence language priming. The purpose of this format was to investigate the extent of the linguistic influence on cognitive performance when subjects are explicitly exposed to language, by comparing results obtained in Experiment 1 with results obtained in Experiment 2 involving language. This experimental format also shows whether subjects performed similarity judgements in parallel with verbal similarity. Viewed under this angle, this experimental format has the further potential to test predictions regarding the correlation between semantic and cognitive foregrounding and backgrounding, as mentioned in section 5.2.1. Indeed, one central question is whether the semantic salience of the main verb in the sentence entails the psychological supremacy of the concept encapsulated in this verb, so that one might expect explicit verbal similarity to match with association choices. In addition, this experimental format may further assess the event-general and event-specific hypotheses, discussed in section 1.4.4., that is, whether language influences exist only when language processing interferes with cognitive processing.

⁴ Recall that in each set of video clips, it is always possible to associate two motion events in terms of PATH and two in terms of MANNER – regardless of whether the language is French or English. For in both languages, the concepts of PATH and of MANNER are similar in two video clips in each set.

⁵ However, recall that there were in fact three possible choices in each set. The third pair corresponds to an ‘impossible’ combination displaying neither PATH nor MANNER similarity.

⁶ Note that this experimental format was only carried out for the main study, and not for the pilot tests.

6.1.5.3. Task Administration

Another point worth mentioning in this section relates to the method of administration of the test, and more specifically to the instructions given by the researcher to the subjects. These instructions were as succinct as possible, detailing only the task at hand but not the stimuli themselves (see Appendix E). Subjects were told that the purpose of the work was to examine some aspect of how the human mind works. No mention of language was made. Subjects were instructed in their native language. Instructions were printed on the test form so that the subjects may refer to them at any time, and they were read aloud by the experimenter:

The present cognitive test is a sorting task. This means that you are asked to associate stimuli in terms of similarity. The stimuli are video clips, which you will see on the TV in a minute. Each video clip is short and mute, lasting less than 10 seconds. The video clips are organised in sets of three; so, for example, set 1 comprises 3 video clips a, b, and c, and set 2 comprises 3 video clips a, b, and c, and so on. There are fifteen sets in total. You will be shown one set of three video clips at a time. After each set, I will pause the machine. During this time, your task is to decide which two video clips are more similar out of the three by circling the two letters corresponding the video clips of your choice; for example, you may decide to associate a & b, a & c, or b & c.⁷ If you want to see all three video clips again, I will rewind the tape. If you cannot decide which video clips are more similar, because all three seem the same, or all three are too different, or for any other reason, then you do not have to make a choice: just leave the form blank, or write ‘can’t decide’. What is important to understand is that the choice is yours entirely, and that there is no right or wrong answer, so that you may make a different choice from other people. It’s ok. Finally, there is no trick and this test is not about intelligence or general aptitude.

Instructions were rather theoretical and possibly vague, and as a result the task might not have appeared altogether clear to subjects prior to the start of the experiment. Hence in order to avoid misunderstandings and confusion, subjects were first shown two ‘dummy’ or practice sets of stimuli. The first ‘dummy’ set showed three motion events, which both languages would typically depict with a bare verb; and the second ‘dummy’ set displayed three states:⁸

Set [0]	A a man is reading a newspaper	A un homme lit le journal
	B a man is reading a book	B un homme lit un livre
	C a man is writing a note	C un homme écrit un message
Set [Ø]	A a man with his tie undone	A un homme avec une cravate défaite
	B a man with his hands tied by a rope	B un homme les mains liées par une corde
	C a man with his shoe laces undone	C un homme avec des lacets défaits

⁷ Instructions differed for the experiment requiring linguistic elicitations, as follows: “During the pause, you have two things to do: first, write down a brief description of each video clip on the dotted lines; and second, decide which two video clips are most similar and circle the two letters that correspond to your choice.”

⁸ In both dummy sets there is only one correct choice in both languages, i.e. [0a] and [0b], and [Øa] and [Øc]. This was to ensure ease of understanding and explanation, if needed, and subjects’ confidence regarding the test.

Once these two sets had been visualised, subjects were presented with the opportunity to ask questions before proceeding with the test.

Finally, in most cases, subjects were tested in groups. Group size varied from one to fifteen subjects at the most. The average size of a group was half a dozen subjects. Subjects often brought a friend. This administration format was favoured for the participants' comfort so that task-related anxiety and resulting performance errors might be minimised. Tests were conducted in standard university classrooms.

Once the task was completed, subjects were informally interviewed concerning the task. The goal of the debriefing was to assess the areas in which they encountered difficulty and to monitor their understanding of the test, as well as their understanding of their own performance. Debriefing also involved gathering participants' overall impressions, and further allowed for questions and general information about the tests to be exchanged.

In some cases, introspection was also carried out during the test. This format involved one-to-one sessions during which the subject was asked to justify his/ her associations in each set, with his/ her responses being taped when possible. The aim was thus to get subjects to reflect upon their own perceptions and behaviour. By seeking an understanding of the response patterns obtained in experimental conditions in this manner, introspections add a qualitative aspect to the present research. Indeed, it was hoped that the features attended to by subjects during performance would be made explicit and might enlighten some deeper processes at work.

Introspections were implemented carefully, typically during and after performance, in order to circumvent memory lapses in the former case, and in order to obtain an overall reflective picture in the latter case. Subjects were asked for descriptions, rather than analyses, of what they attended to or thought about during performance. A typical question, for instance, asked the participants whether their performance would be likely to change or remain the same were the same test to be implemented again at a later date. Note that, overall, subjects were not asked to describe their thought processes or to interpret why they attended to a specific feature rather than another.

6.1.6. HYPOTHESES

General motion-related predictions have been made in section 5.2. These predictions seek to establish to directionality of the potential influence of the language variable on the cognition variable. They fundamentally rely on the idea that the linguistic codability of specific semantic items may impact on the cognitive salience of the concepts corresponding to these items, or in Berman and Slobin's words (1994: 640):

frequent use of forms directs attention to their functions, perhaps even making those functions (semantic and discursive) especially salient on the conceptual level. That is, by accessing a form frequently, one is also directed to the conceptual content expressed by that form.

This sub-section reiterates these predictions in light of the present experimental tests.

6.1.6.1. Verb Complex Salience

Firstly, if we assume the semantics of the verb complex to encode the most cognitively salient conceptual information, then French subjects are hypothesised to associate the stimuli in each set in terms of PATH similarity. On the other hand, we may formulate three possibilities for English subjects, as detailed in section 5.2.1. That is, the English responses may be hypothesised to result in (i) a mixed performance if PATH and MANNER are equally salient given that the typical English motion verb complex comprises both a main verb *and* a satellite; or (ii) a higher frequency of MANNER associations if the main verb encodes the most salient information; or finally (iii) a higher frequency of PATH associations if the satellite encodes the most salient information.

In Experiment 2, the primary hypothesis is that explicit linguistic encoding will bias subjects' choices, so that their performance is expected to parallel their native language typology, possibly more closely than in Experiment 1. Following Gennari et al. (2002: 72), we may then formulate two sub-hypotheses, (a) an *event-specific hypothesis* according to which the similarity judgement for a specific set will match the dimensions of motion encoded twice across the three descriptions, and (b) an *event-general hypothesis* according to which the similarity judgement will typically match the language typology, regardless of the descriptive content for a specific set of motion scenes.⁹ With regards to (a), insofar as the elicited descriptions match the respective typologies for motion event expression in both languages, we may expect the same patterns as above to be performed in an even greater amount. However, we would hypothesise that the choices may not match our predictions when the elicited descriptions differ from the typologies, e.g. an English sentence with a bare PATH verb, or a French sentence with a bare MANNER verb. The (a) prediction would thus afford a variability margin in cognitive responses corresponding to the linguistic variability in the sentences elicited. However, in the case of (b), we may hypothesise that the same choice patterns as above will be found in an even greater proportion, regardless of the specific descriptions being provided. That is, the French data should provide more PATH associations than the English data overall.

⁹ Note that the results reported by Gennari et al. (2002: 73) give support to the event-general hypothesis.

6.1.6.2. Verb Complex Backgrounding

Secondly, if we assume Talmy's universal principle of semantic salience according to which the most salient information is encoded outside the verb complex (1985: 122), then we may, more or less, expect the opposite patterns to the ones described above. This reversal of hypotheses is most obviously relevant for the French sample, whose linguistic typology typically foregrounds MANNER outside of the verb complex. It may thus be hypothesised that French speakers will display preferential association patterns for stimuli similar in MANNER. On the other hand, because English typically backgrounds both PATH and MANNER, we may expect a mixed performance with no definite preferential pattern overall. However, English does foreground MANNER when it is somewhat exceptional or seemingly deserves emphasis (see section 5.2.2.). It could thus be hypothesised that English speakers may show a preference for MANNER pairs when the MANNER is not default, e.g. LIMPING. Again, these tests will confirm which piece of information is most salient: the one encoded in the satellite or the one encoded in the verb, despite the backgrounded nature of the verb complex.

In Experiment 2, the primary hypothesis is the same as above. In the case of the event-specific hypothesis, we may expect French subjects to perform more MANNER associations if MANNER is expressed outside the verb complex, whereas we may expect more PATH associations from English subjects if the PATH is expressed outside the verb complex. Overall however, we may expect subjects to perform their associations in parallel with similarity in the semantic elements found outside the VP. In the case of the event-general hypothesis, we would expect a general tendency for French speakers to associate in terms of MANNER. Predictions regarding English subjects' behaviour are less easy to specify, and again may be expected to show equipotential variability.

6.1.6.3. PATH CR Salience

Following Talmy (1991: 483), we may suggest that PATH represents the core meaning of a motion event, so that in the case of English where neither PATH nor MANNER is foregrounded, PATH may still be the decisive association factor. Such a possibility would equally apply to French cognitive responses, in which case the above prediction of foregrounded MANNER salience would no longer hold. PATH salience predictions would entail similar performance across both language groups in favour of PATH.

6.1.6.4. Summary of Hypotheses

In both sample groups, it is generally hypothesised that subjects performing linguistic descriptions prior to the cognitive test will display higher proportions of PATH or MANNER associations, and hence neater preferential patterns than subjects taking the cognitive test only. It

is also expected that French and English speakers will perform differently if language were to have any form of influence on similarity judgements at all.

If the verb complex bears more salience, it is expected that French speakers will perform more PATH associations than English speakers; whereas, if the verb complex bears less salience than the foregrounded information located outside the verb complex, it is expected that French speakers will perform more MANNER associations than English speakers.

In both cases, the null hypothesis would predict either no distinct pattern resulting in random associations for both groups, or a universal pattern whereby most subjects in both groups perform significantly similar associations.

Finally, note that event-specific and event-general hypotheses are not applicable in the case of PATH CR salience, as in this case, SRs are no longer predicted to impact on CR salience.

Table 6.2. Summary of hypotheses.¹⁰

	Random distribution	Similar distribution for both groups	MANNER preference	PATH preference	No preference, i.e. equal distribution
Verb Complex Salience					
Null	E ₁ + E ₂ F ₁ + F ₂	E ₁ + E ₂ F ₁ + F ₂			
Experiment 1			E ₁ (ii) F ₁	E ₁ (iii) F ₁	E ₁ (i)
Event-specific			E ₂ (ii) F ₂	E ₂ (iii) F ₂	E ₂ (i)
Event-general			E ₂ (ii) F ₂	E ₂ (iii) F ₂	E ₂ (i)
Optional Constituent Salience					
Null	E ₁ + E ₂ F ₁ + F ₂	E ₁ + E ₂ F ₁ + F ₂			
Experiment 1			E ₁ ? F ₁	E ₁ ?	E ₁ ?
Event-specific			E ₂ ? F ₂	E ₂ ?	E ₂ ?
Event-general			F ₂		E ₂ ?
PATH CR Salience					
Null	E ₁ + E ₂ F ₁ + F ₂				
Experiment 1		E ₁ + E ₂ F ₁ + F ₂		E ₁ + E ₂ F ₁ + F ₂	
Experiment 2		E ₁ + E ₂ F ₁ + F ₂		E ₁ + E ₂ F ₁ + F ₂	

¹⁰ E₁ refers to the group of English subjects participating in Experiment 1, and E₂ to the English group in Experiment 2. F₁ refers to the group of French subjects participating in Experiment 1, and F₂ to the French group in Experiment 2.

6.1.7. SUMMARY

These tests endeavoured to meet the guidelines for scientific rigour outlined by previous researchers, especially Lucy (e.g. 1992a) – as discussed in section 3.2.1. Hence, the present research is comparative, using data from English and French. These data are linguistic *and* non-linguistic, thereby avoiding argumentative circularity. The epistemology followed is multi-disciplinary, involving linguistic analyses (c.f. section 5.1.), psychological experiments, and cognitive analyses. The linguistic study focus – as discussed in Chapter 5 – concerns a pervasive domain in conceptualisation and expression, rather than an ad hoc domain. Furthermore, this focus involves analyses at the sentence level, rather than the examination of isolated lexical items. The scope of reference to reality is thus maximised by those choices.

In addition, cultural interference with behaviour in the tests is reduced by the very choice of the communities under study conditions, as both share a common history and a highly comparable cultural status in modern society, in economic, political, social, and educational terms. Hence, divergences in the cognitive data – if any – are more likely to be attributable to linguistic rather than cultural variables. To further increase the comparability of those subject samples, they were recruited in university contexts, so that most participants displayed similar profiles in terms of age range, literacy levels, and comfort with testing procedures, for instance. Finally, individual discrepancies were hopefully levelled out by the high numbers of participants in the tasks, i.e. over thirty in each experimental group – alongside the use of a pilot study.

6.2. PILOT RESULTS (N=22)¹¹

The empirical tests were first carried out in a pilot study in May and June 2001 with a British English-speaking sample consisting of twenty-two subjects. In this experiment, all subjects performed the similarity judgement test only, and took part in a post-task debriefing session.

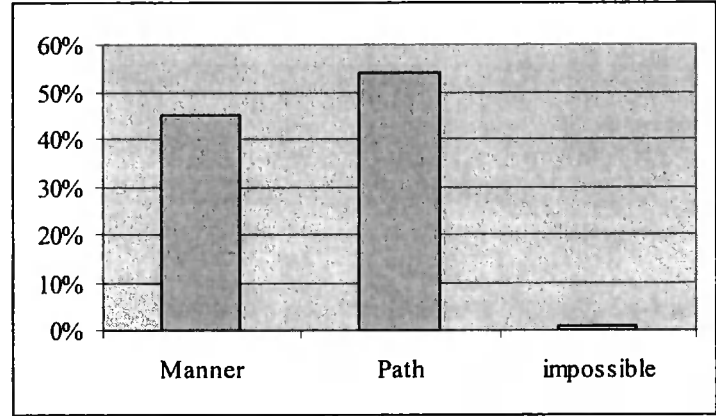
Thirteen sets of stimuli were used (see Appendix B), of which two were deemed flawed after debriefing, i.e. subjects performed their associations in terms of some unrelated distractor (e.g. electrical versus non-electrical appliances present in stimuli).

Overall, subjects understood the task very easily, though they found performing the test difficult at times. As the task progressed, most subjects were able to infer that *PATH* and *MANNER* in motion events were the focus of the test. They also clearly realised that there were always two ways one could decide to pair the stimuli.

¹¹ Unless otherwise stipulated, statistical tests for related score samples were non-parametric Wilcoxon tests, and statistical tests for unrelated score samples were non-parametric Mann-Whitney U-tests.

6.2.1. ITEM SET ANALYSIS

Results indicate that subjects positively associate in terms of either PATH or MANNER similarity, thereby confirming that methodological control over contextual variables was successful – except in the case of sets [3] and [4]. Yet there seems to be no definite preferred pattern of association amongst the present sample of English speakers. In other words, this initial batch of results appears to be inconclusive. Indeed at first glance, English-speaking subjects seem to make more-or-less free associations. We obtain a total of 110 associations in terms of MANNER, and 130 associations in terms of PATH, with a mean score of 10 MANNER associations and 11.82 PATH associations.¹² At first glance, these results indicate a mixed performance with a slight preference overall for PATH associations (see Graph 6.1.).



Graph 6.1. Proportions of association types – pilot study.

These results appear to align with predictions suggesting equipotential variability in English cognitive responses. Equipotential variability, however, would entail equivalent distributions of PATH and MANNER scores in most stimuli sets. An itemised breakdown of the findings indicates that this is not the case – except in sets [1] and [11] (see Table 6.3.). The present results indeed suggest that there are preference patterns for either PATH or MANNER in most sets of stimuli at the item level. What is unclear at this stage is precisely the factor(s) responsible for these preferences. Four sets display PATH preference quite neatly (i.e. [2], [5], [8], [9]), and five sets show MANNER preference (i.e. [6], [7], [10], [12], [13]).

¹² Note that sets [3] and [4] are flawed stimuli and hence are not included in the analysis.

Table 6.3. Associations by English subjects – pilot study.

SET	MANNER	PATH	Impossible	Not Sure
SET 1	11	11		
SET 2	7	15		
SET 3 (flawed)	2	11	9	
SET 4 (flawed)	6	5	9	2
SET 5	0	21	1	
SET 6	19	2	1	
SET 7	13	9		
SET 8	1	21		
SET 9	6	16		
SET 10	14	8		
SET 11	10	12		
SET 12	15	7		
SET 13	14	8		
TOTAL	110	130	2	
AVERAGE %	45%	54%	1%	
MEAN	10	11.82	0.18	

6.2.2. INDIVIDUAL PERFORMANCE ANALYSIS

Preferential patterns in cognitive responses were also sought at the individual level. Interestingly, all subjects performed both types of association, so that not a single individual paired all stimuli with an absolute preference for either MANNER or PATH.

Three different types of individual performance were found across the twenty-two subjects in the pilot study, (a) MANNER dominance (≥ 7 sets selected out of 11), (b) PATH dominance (≥ 7 sets selected out of 11), and (c) no clear dominance.¹³ Pattern (a) appears in six subjects; pattern (b) appears in eight subjects; and pattern (c) appears in eight subjects (see Table 6.4.). Preferential patterns thus appear to be fairly distributed across this subject sample.

Looking at the linguistic profiles of subjects displaying pattern (a), it is found that of the six subjects, four have knowledge of French and German without being fluent in either; one is fluent in German; and one only has basic knowledge of Arabic. In the case of pattern (b), out of the eight subjects, two are fluent in French; four have some knowledge of French; four have some knowledge of other satellite-languages, and one is monolingual. In pattern (c), of the eight remaining subjects, all have some knowledge of other Indo-European languages, but none is fluent in any language but English.

¹³ Dominance was thus established on the basis of at least two differential associations.

Table 6.4. Subjects’ linguistic profiles – pilot study.

	(a) MANNER dominance N=6	(b) PATH dominance N=8	(c) No clear dominance N=8
Monolingualism/ S-languages only	2	2	3
Knowledge of V-framed language(s)	4	4	5
Fluency in V-framed language(s)		2	

Little may be concluded from this analysis, as Table 6.4. does not suggest strong enough correlations between preferential patterns and subjects’ linguistic profiles.

6.2.3. INITIAL REFLECTION

The overall conclusion from the pilot study is that the results appear most uncertain and irregular. An initial consideration would be to include more subjects in the experiment in order to verify the presently obtained preference patterns. Secondly, two sets of stimuli were faulty and a few video clips needed re-making for quality purposes. In other words, the experiment needed to be administered again.

Another suggestion for further experimentation was to re-order the stimuli in each set, to ensure that subjects’ short-term memory is not distracted by the order in which the stimuli are presented to them and that their decisions are not based on such distracted recall.

Finally, the itemised statistics shown in section 6.2.1. suggest that stimuli sets yield differing responses. This variability will be further examined in the following sections and more fully discussed and analysed in Chapter 7.

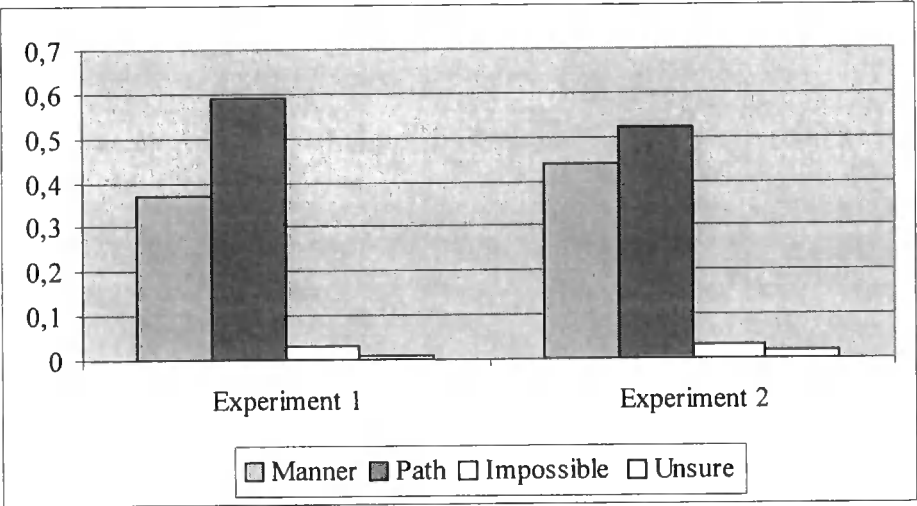
6.3. ENGLISH RESULTS (N=64)

The empirical tests for the main study were implemented in the UK in March, April and May 2002 with a sample of sixty-four native English speakers. The majority of participants were students at the University of Durham. In these tests, thirty-four subjects participated in Experiment 1 (i.e. similarity judgements only), and thirty subjects participated in Experiment 2 (i.e. linguistic descriptions and similarity judgements).

Given the considerations arising from the pilot study, the first step in the main study experiments was to re-make the stimuli in several instances to remedy design flaws (see Appendix C). Additional sets were also created. Some sets were showed twice but in differing orders of display of the video clips, e.g. sets [3] and [9]. Fifteen sets were used in total, hence forty-five motion scenes were displayed. Following pre- and post-task linguistic monitoring, it appears that the stimuli used in the main study presented no such flaws as in the pilot study, i.e. pilot sets [3] and [4].

6.3.1. ITEM ANALYSIS

From the present results, there seems to be no definite preferred pattern of association amongst the present sample of English-speaking subjects, in that we obtain associations based on PATH and on MANNER similarity for each set of stimuli in both groups. Nonetheless, we obtain a preferential trend for PATH associations in both experiments (see Graph 6.2.). This preferential trend is statistically significant in the first experimental format using cognitive only data ($R_1=287.5$, $N=15$, 15 , $p=0.021$). However, the difference between MANNER and PATH scores is not significant in the second experiment using language elicitations prior to the cognitive responses ($R_2=252$, $N=15$, 15 , n.s.).

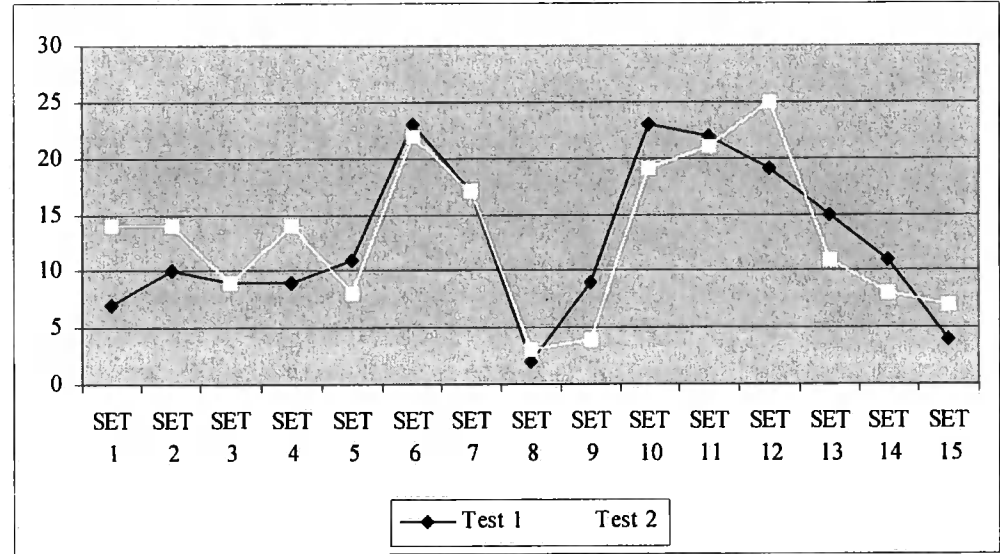


Graph 6.2. English association patterns in experiments 1 & 2.

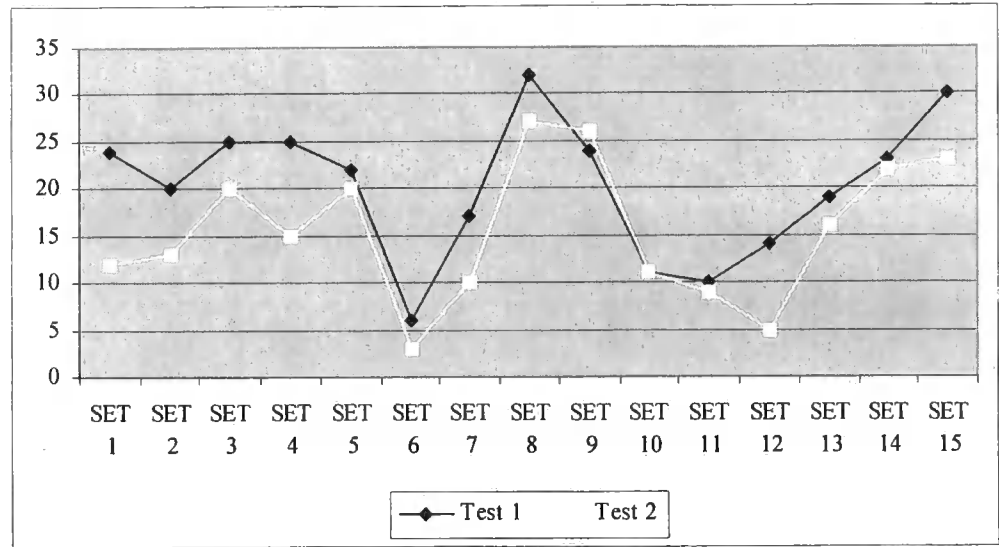
Both groups performed similarly on the cognitive test, despite Group 2’s exposure to language prior to making the associations. However, we can observe that score differences are less marked in Experiment 2. This could suggest that the explicit encoding of MANNER in the main verb of a sentence (or sometimes in an optional constituent) alters subjects’ judgements so as to obtain a slightly higher frequency of MANNER associations than when language is not used at all in the task. Either we attribute this effect to a linguistic influence mediated by the explicit encoding of MANNER in the main verb or in a foregrounded optional constituent. Or, alternatively, we may suggest that for the descriptive purpose of the linguistic task, subjects pay attention to more elements in the motion scenes, some of which they might otherwise deem of little importance, e.g. whether the actor’s hands are in his pockets, or possibly the MANNER of the motion. This conditioning might have the effect of distracting their spontaneous choice away from PATH-based associations (which seem to be the more natural norm, following the findings in Experiment 1), and inducing more MANNER-based choices. This simply amounts to the observer’s paradox, which entails unnatural responses to controlled tasks. Obviously, the more

controlled and the more complex the task, the less spontaneous and hence realistic the responses. It may well follow that, though unbiased by our crucial independent variable, the responses provided by Group 1 were more reliable as they were less prone to experimentally-induced deviations for natural behaviour.

To clarify this issue, the performance of both groups was also compared on the similarity judgement test. As just mentioned, it was expected that Group 2 would be influenced by language in their choices, with the likely possibility that more associations in terms of either MANNER or PATH would be found. Cross-experimentally, however, the differences between Experiment 1 and Experiment 2 for MANNER and for PATH associations prove non-significant ($R_M=233$, $N=15,15$, n.s.) and ($R_P=271$, $N=15,15$, n.s.) respectively, suggesting that both groups are displaying very similar behaviour overall (see Graphs 6.3. and 6.4.). Seemingly, our hypothesis that language would influence similarity judgements is therefore not confirmed in any straightforward way.

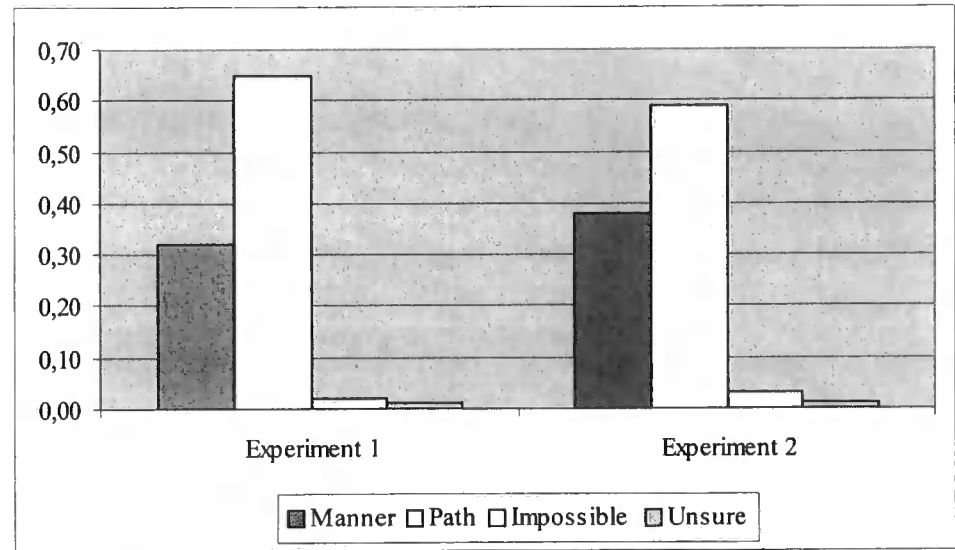


Graph 6.3. Frequency of MANNER associations in Experiments 1 & 2.



Graph 6.4. Frequency of PATH associations in Experiments 1 & 2.

However, in comparing the two experiments, it is apparent that the *same* triads fail to show a PATH preference – as can be seen from Graphs 6.3. and 6.4. above. The relevant four sets ([6], [10], [11], and [12]) either contain an extra element (besides the human body) being used to perform the motion (e.g. a scooter, a ladder), or a ‘salient’ type of MANNER (e.g. a severe limp, a strong kick). These extra elements may have violated typical expectations concerning motion scenes and were filtered out as potential distractors. Using this filter, the difference between MANNER and PATH associations now becomes significant in *both* experiments ($R_1=55$, $N=11$, $p_1=0.005$), and ($R_2=56.5$, $N=11$, $p_2=0.037$) (see Graph 6.5.).

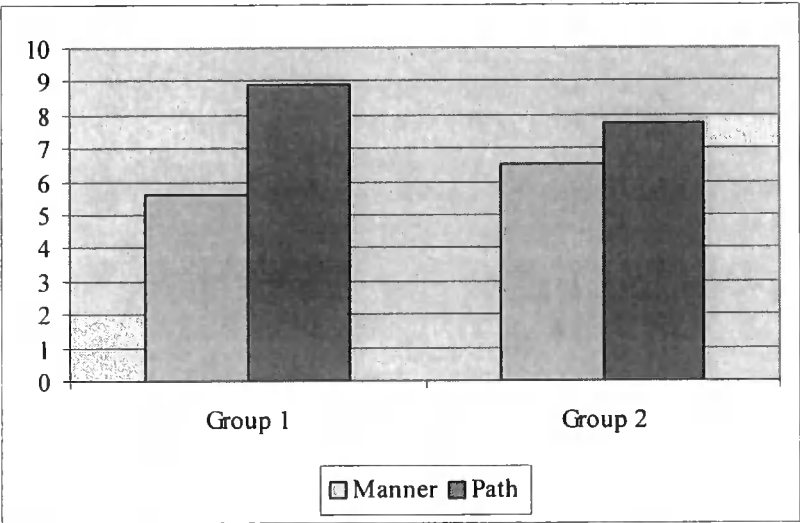


Graph 6.5. Proportion of association types in Experiments 1 & 2 – using a filter.

The nature of this internal variability will be more fully analysed and discussed in Chapter 7.

6.3.2. INDIVIDUAL PERFORMANCE ANALYSIS

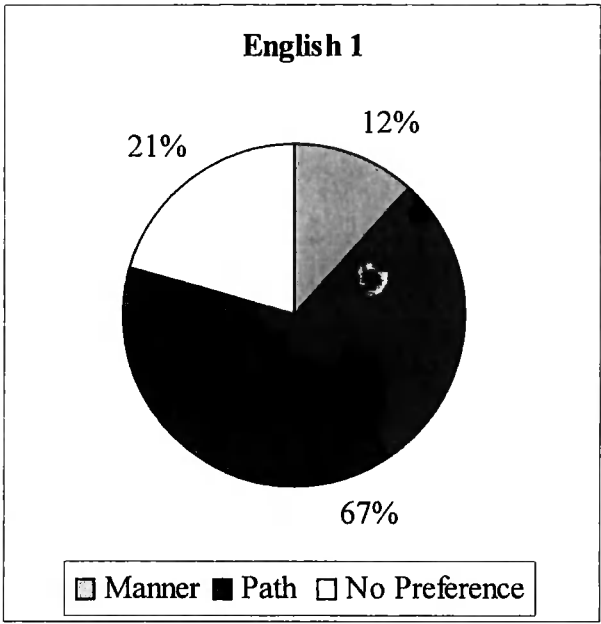
The subject analysis reveals that all participants performed both types of associations. All fifteen stimuli sets included, a statistically significant difference is found in the first experimental group between PATH and MANNER scores, with a definite preference for PATH pairs ($R_1=1585.5$, $N_1=34$, 34 , $p<0.05$). However, in Group 2, the statistical test reveals no significant difference between the frequency of PATH and MANNER pairs, despite stronger scores for PATH associations ($R_2=1017.5$, $N_2= 30, 30$, n.s.). Thus, the basic prediction that subjects would perform more associations of one type than of the other is confirmed for both groups, though the difference is reduced when subjects perform the language task prior to the sorting test (see Graph 6.6.).



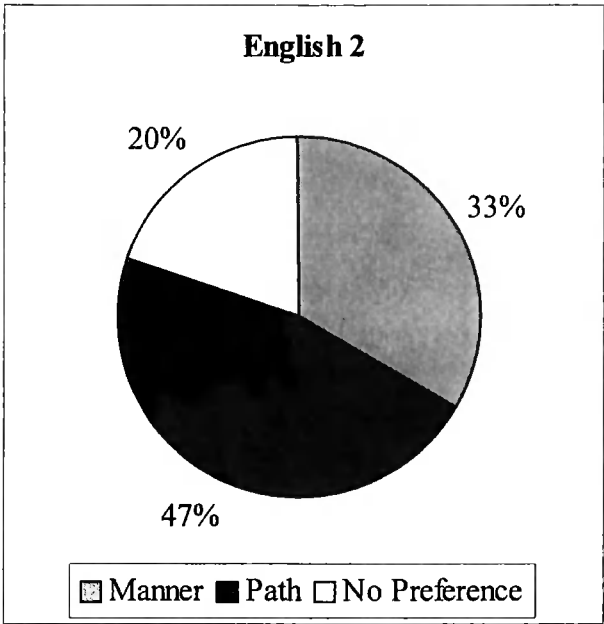
Graph 6.6. Subjects' mean association scores in Groups 1 & 2.

Here again, the differences between Group 1 and Group 2 are not statistically significant for either MANNER or PATH associations ($R_M=986.5$, $N=34,30$, n.s.) and ($R_P=1244$, $N=34,30$, n.s.), positively suggesting that both groups are displaying very similar behaviour.

Regarding preferential tendencies at the individual level, none of the 64 subjects paired all stimuli with an absolute preference for either MANNER or PATH. However, we obtain clear dominance patterns at the individual level for PATH associations (see Graphs 6.7a. and 6.7b.). Dominance patterns were estimated on the basis of at least two differential associations, e.g. MANNER dominance entails a minimum of 9 MANNER pairs, and a maximum of 6 PATH pairs – and vice versa for PATH dominance.



Graph 6.7a. Group 1 dominance patterns.



Graph 6.7b. Group 2 dominance patterns.

A striking 21% difference is apparent between Group 1 and Group 2 with regard to MANNER and PATH dominance. Though this difference does not appear at the item analysis level, it cannot be ignored, and is likely to be indicative of a task-on-task effect, whereby the absence and/ or presence of language prior to the task results in differential performance at the individual level.

However, these differences may also be an effect of individual profiles, e.g. in terms of linguistic background, as half a dozen subjects only had no knowledge of verb-framed languages. Subjects' linguistic profiles are plotted against their dominance pattern in Table 6.5.

Table 6.5. English subjects' linguistic profiles.

Linguistic Profile	(a) MANNER dominance	(b) PATH dominance	(c) No clear dominance
Knowledge and fluency in S-framed language(s) only	1	4	5
Knowledge of V-framed language(s)	13	27	6
Fluency in V-framed language(s)		6	2

Nothing conclusive may be drawn from these plotted figures. Similarly to the pilot tests, the linguistic profiles do not seem correspond to responses. The data demonstrates a lack of transparent correlation – if any at all.

6.3.3. LINGUISTIC ANALYSIS

The linguistic descriptions provided by all subjects confirmed the lexicalisation pattern typically followed in the English language to depict motion events, as discussed in Chapter 5. Indeed, in

85% of descriptions, the main verb encodes the MANNER of the motion event, whereas in only 15% of cases the verb expresses the PATH of motion.

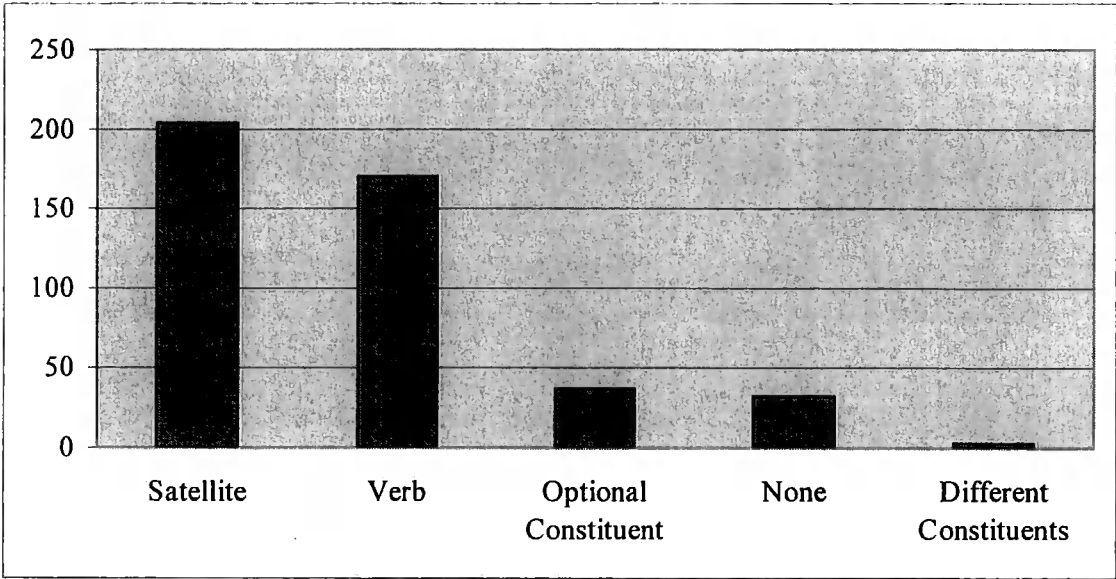
As indicated above, this experiment was expected to reveal whether the explicit use of language may influence the on-line processing of visual stimuli and hence bias associative reasoning. For relativistic purposes, performance was expected to show associations matching with linguistic similarity. For instance, three sentences comprising two similar verbs (or other category) might induce pair choice based on that similarity. This kind of linguistic influence on cognition is different from the subversive type of influence speculated about by Whorf, yet it is a type of influence still, whereby language may become a cognitive strategy to deal with non-linguistic facts (Tyler and Spivey 2001, Papafragou et al. 2002, Gennari et al. 2002).

An interesting finding is that associations were typically *not* made in parallel with similarity in the main verb, e.g.¹⁴

- Set [7] ☒ A Man *cycling* up a hill
 B Man *cycling* down a hill
 ☐ C Man walking up a hill
- Set [10] ☒ A Man *limping* towards woman sitting down
 ☐ B Man *walking* normally towards woman sitting down
 C Man *limping* away from woman sitting down

In fact, in 62% of cases, associations do not match verbal similarity, e.g. [7A] and [7B] in the above example. In only 38% of cases do associations match verb similarity (see Graph 6.8.).

¹⁴ Framed letters in the examples show the association performed by the subject.



Graph 6.8. Frequency of matches between similar linguistic elements & associations.

Similar findings have been reported in Papafragou et al. (2002: 210) who noted that

[i]n neither language groups did verb matches correlate consistently with categorisation performance.

On the other hand, as indicated by Graph 6.8., associations parallel satellitic similarity in 46% of instances, as in the two examples provided above. In 8% of cases, the parallel occurs with optional constituents, i.e. typically foregrounded information, in Talmy’s sense, e.g.

- Set [10] ☒ A man walking *with limp*
 ☐ B man walking normally
 ☐ C man walking *with limp*

In another 1%, the choice parallels similarity between two different types of constituents, e.g. a verb and an optional constituent. And perhaps even more interestingly, in 7% of instances, there is no match between the type of association and the corresponding linguistic descriptions, e.g.

- Set [3] ☒ A man walking down road
 ☐ B man crossing road
 ☐ C man running down road

Regarding foregrounded information, only two subjects did not foreground any information in any of their descriptions. The other twenty-eight subjects foregrounded information in their linguistic descriptions across a range of 1-8 sets of descriptions. In thirty-eight sets, we obtain a parallel between similarity judgement and the type of information being foregrounded, e.g.

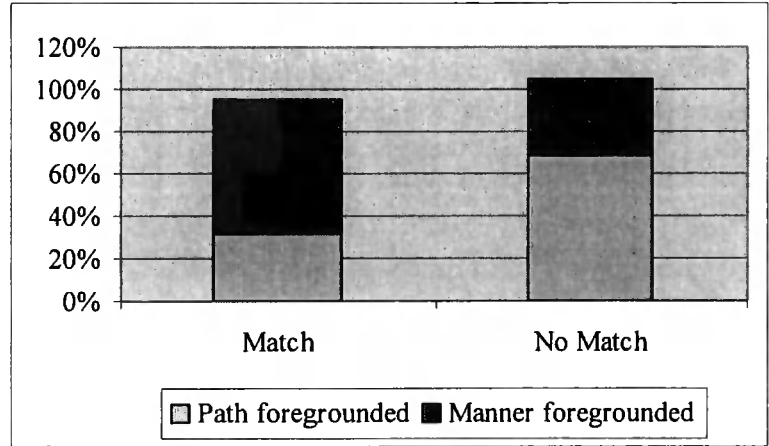
- Set [2] **A** walking downstairs *on tiptoes*
B walking upstairs *on toes*
C walking upstairs on feet

This is a typical example of a MANNER association with MANNER being encoded in the main verb and also being foregrounded in an optional constituent outside the verb complex. In nine cases, PATH is the element of motion chosen as the basis of the similarity judgement as well as being linguistically foregrounded; and in twenty-nine cases it is the element of MANNER that is both chosen and foregrounded, as in the above example. This pattern is precisely what we might expect according to Talmy’s universal principle of salience (1985: 122).

However, in another thirty-six sets, we fail to obtain a parallel between the chosen association and the type of information that is foregrounded in the corresponding descriptions, e.g.

- Set [2] **A** walking downstairs on tiptoe
B walking upstairs *on tiptoe*
C walking upstairs *normally*

This pattern is repeated in twenty sets where the foregrounded information relates to PATH and in sixteen sets where the foregrounded information relates to MANNER (see Graph 6.9.). There seems therefore to be little correlation between linguistic foregrounding and association choice. We may infer that Talmy’s principle of salience is a linguistic analysis only, and not a cognitive reality.



Graph 6.9. Cumulated proportions of matches between association type & linguistic foregrounding.

6.4. FRENCH RESULTS (N=75)

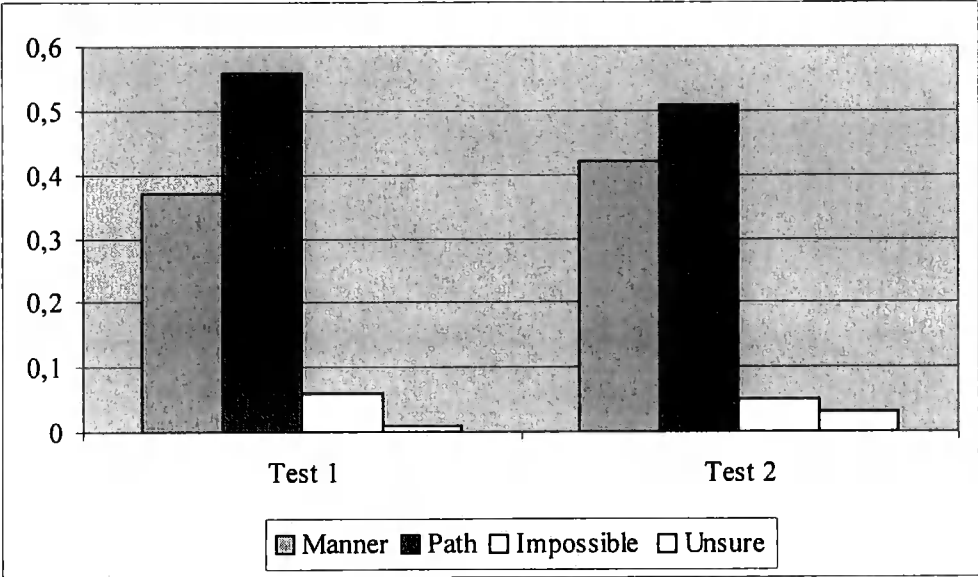
The same experimental study was reproduced in France in March 2003 with a sample of seventy-five native French speakers. The vast majority of subjects were students from the University of Paul Valéry at Montpellier. Thirty-five subjects participated in Experiment 1 (i.e. similarity judgements only), and forty subjects participated in Experiment 2 (i.e. linguistic descriptions and similarity judgements).

The aim of reduplicating the experiments with French subjects was to obtain comparative data from a community of verb-framed language speakers.

Overall, results greatly resemble those obtained in the English study. This section follows a similar organisation to section 6.3. to present the findings.

6.4.1. ITEM ANALYSIS

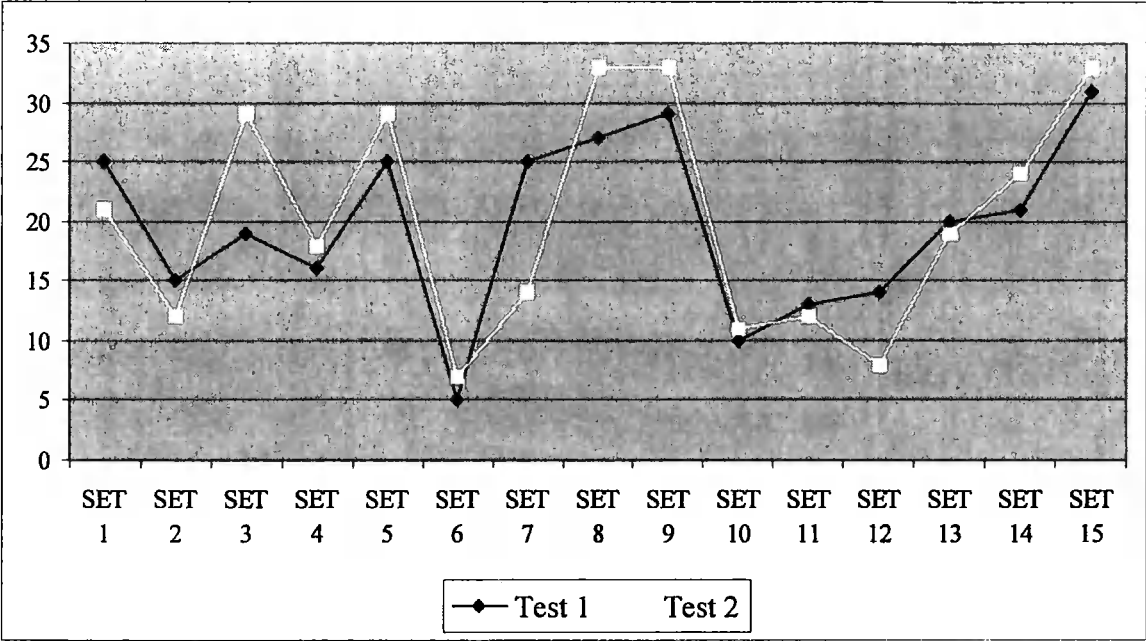
The French item analysis shows a close similarity to the English analysis. Here again, we obtain associations based on PATH and on MANNER similarity for each set of stimuli. Results indicate a general preference for PATH associations in both experimental formats (see Graph 6.10.). Preferences for PATH are more marked in the first test, with a statistically significant difference between score types ($R_1=286$, $N=15$, 15 , $p=0.026$). However, similar to the English study, this difference is not significant in the second experiment ($R_2=261$, $N=15$, 15 , n.s.).



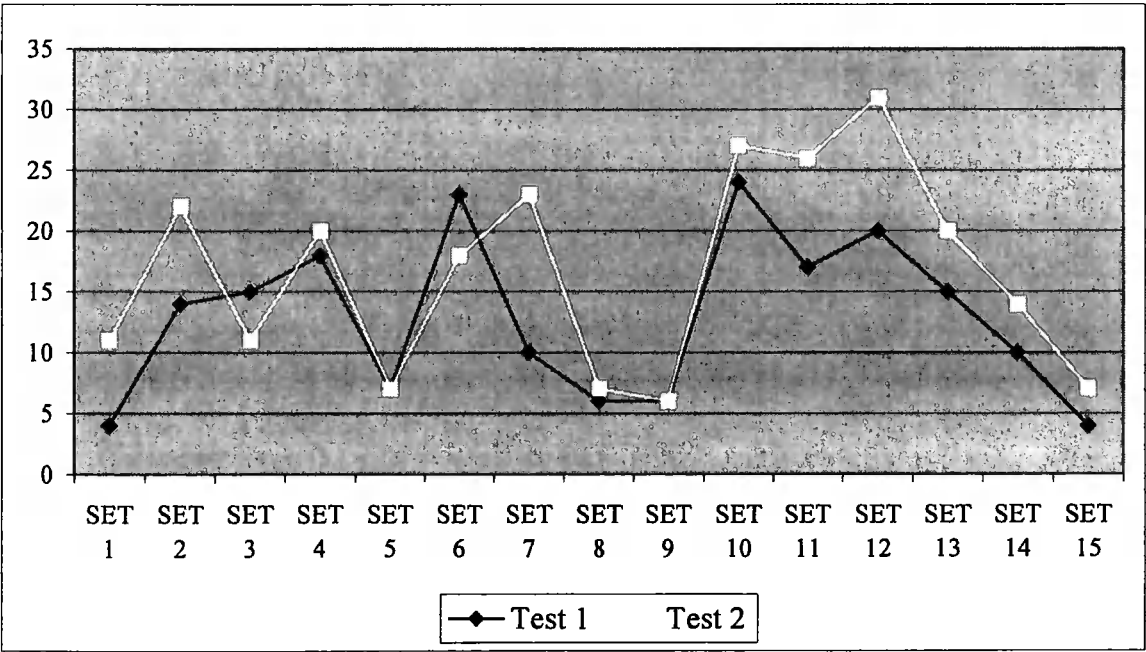
Graph 6.10. French association patterns in Experiments 1 & 2.

Both groups performed similarly on the cognitive test, despite Group 2’s exposure to language prior to making the associations. However, we can observe again that score differences are less marked in Experiment 2. The performance of both groups was also compared on the similarity judgement test. As in the English study, it was expected that Group 2 would be influenced by

language in their choices, with the likely possibility that more associations in terms of either MANNER or PATH would be found. Cross-experimentally, however, no statistical significance was recorded, and it seems that both groups are displaying very similar behaviour overall (see Graphs 6.11. and 6.12.).



Graph 6.11. Frequency of PATH associations in both tests.



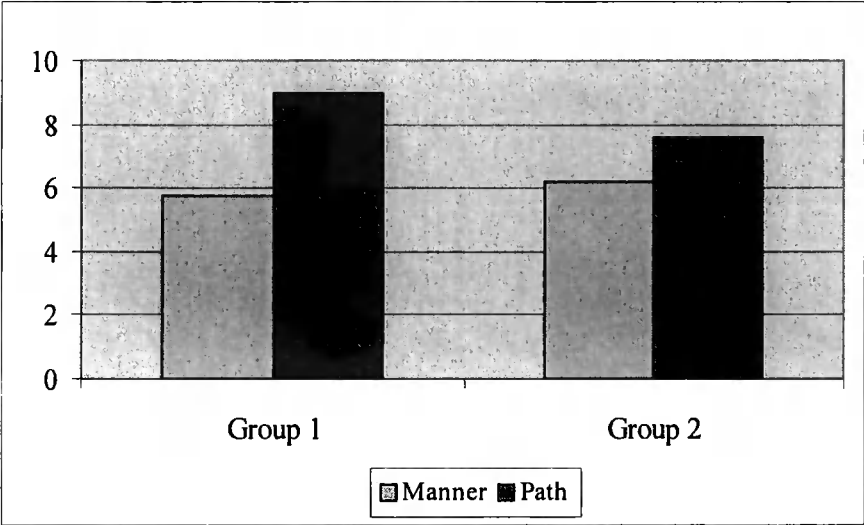
Graph 6.12. Frequency of MANNER associations in both tests.

Four stimuli sets only do not show a clear MANNER preference. These sets are the same as those observed in the English analysis (see section 6.2.1.1.), namely [6], [10], [11] and [12]. This

suggests a definite connection between MANNER type and its relative cognitive salience. This variability will be more fully explored in the following chapter.

6.4.2. INDIVIDUAL PERFORMANCE ANALYSIS

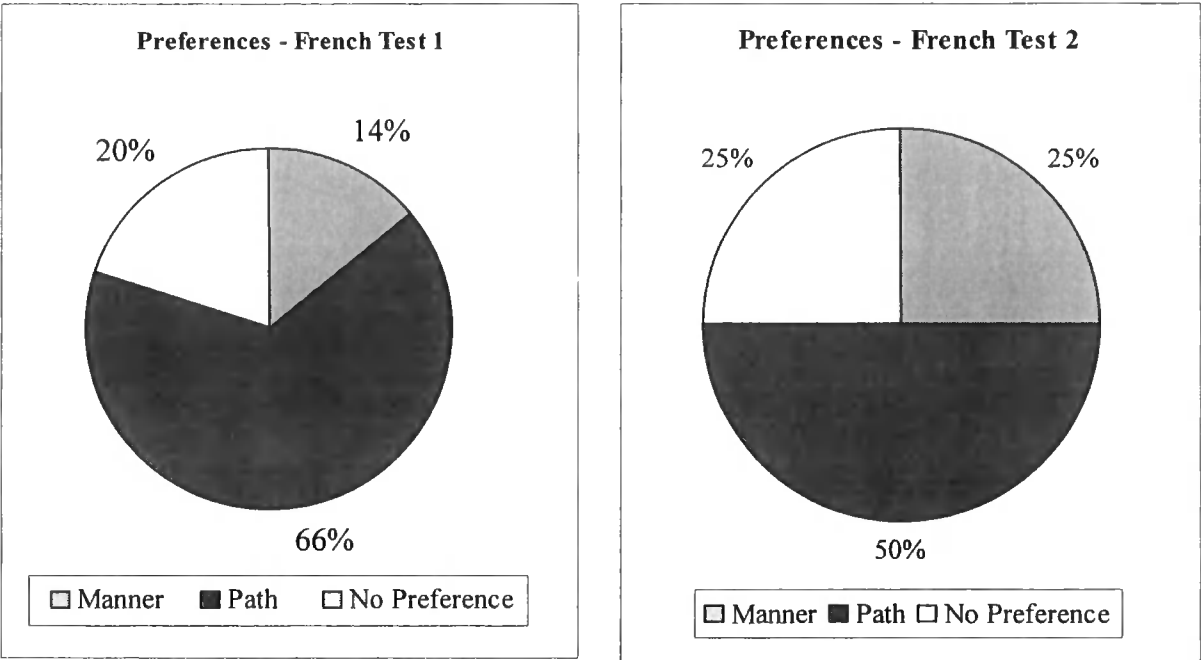
All 75 participants but one performed both types of associations. Only one subject performed fifteen PATH associations, and no other type of associations. The mean scores obtained at the individual level agree with the item analysis by indicating a general preference for PATH associations (see Graph 6.13). In both experimental groups, the difference between score type is statistically significant ($R_1=1619$, $N_1=35$, 35 , $p<0.05$; $R_2=1913.5$, $N_2=40$, 40 , $p<0.05$).



Graph 6.13. Mean scores of association types in both French groups.

Concerning individual dominance patterns, most subjects show a PATH dominance (see Graphs 6.14a. and 6.14b.).¹⁵ Yet, there is a 16% difference between the dominance showed by Group 1 and Group 2 with regard to PATH and MANNER. Though this difference does not appear at the item analysis level, it appears non-negligible and is likely to be indicative of a task-on-task effect, whereby the absence/ presence of language prior to the task results in differential performance at the individual level, as already suggested in the English study results.

¹⁵ Recall that dominance patterns are established on the basis of at least two differential associations.



Graph 14a. Group 1 dominance patterns. Graph 14b. Group 2 dominance patterns.

The correlation – if any – between these dominance patterns and subjects’ linguistic profiles seems somewhat unclear, as these dominance patterns are distributed across the language knowledge types (see Table 6.6.).

Table 6.6. French subjects’ linguistic profiles.

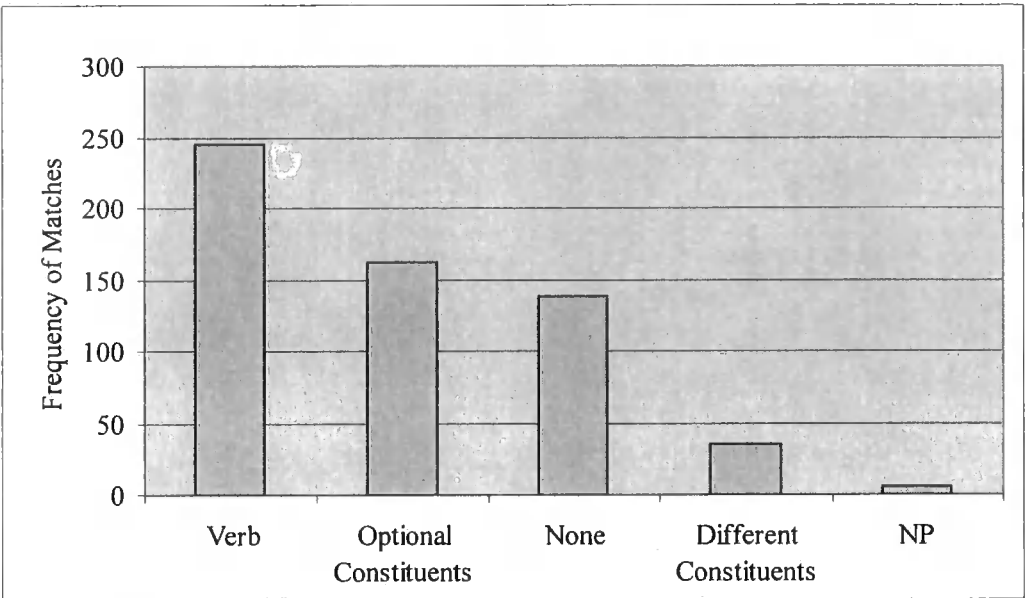
Linguistic Profile	(a) MANNER dominance	(b) PATH dominance	(c) No clear dominance
Fluency and knowledge of V-framed language(s) only		1	
Knowledge of S-framed language(s)	13	34	11
Fluency in S-framed language(s)	2	8	6

These statistics are strikingly similar to those reported in the English batch of results. Again, the conclusion suggested is that there is no transparent correlation between subjects’ knowledge of languages other than their mother tongue and their cognitive response styles.

6.4.3. LINGUISTIC ANALYSIS

As discussed at length in Chapter 5, the linguistic descriptions provided by Group 2 only partially confirmed Talmy’s typology concerning verb-framed languages. Indeed, PATH of motion is conflated in the main verb of the sentence in only 65% of instances. In 33% of instances, MANNER is conflated in the main verb. As discussed in Chapter 5, these figures indicate that although French preferentially follows a verb-framing tendency, it allows PATH main verbs, and MANNER verbs with or without any added PATH information in the sentence.

The main interest in examining these descriptions here, however, is to assess the parallels between categorisation choices and similarity in linguistic elements (see Graph 6.15.).



Graph 6.15. Frequencies of matches between linguistic elements & association choices.

Similar to the results obtained from the English data set, associations parallel similarity in the main verb in only 42% of instances, e.g.

- Set [5] **A** Quelqu'un traverse la route en courant.
 Someone crosses the road running.
- B** Quelqu'un traverse la route en vélo.
 Someone crosses the road on his bike.
- C** Quelqu'un fait du vélo au bord de la route.
 Someone is cycling along the road.

In 28% of cases, the parallel occurs between optional constituents, e.g.

- Set [2] **A** Un homme descend les escaliers sur la pointe des pieds.
 A man goes down the stairs on tiptoes.
- B** Un homme monte les escaliers sur la pointe des pieds.
 A man goes up the stairs on tiptoes.
- C** Un homme monte les escaliers le pied entièrement posé.
 A man goes up the stairs with his feet fully touching the floor.

In a remarkable 26%, there is no parallel between the associations and the linguistic descriptions provided, e.g.

- Set [12] **A** Un homme plonge dans l'eau.
A man dives into the water.
- B** Un homme descend dans l'eau avec l'échelle.
A man goes down in the water with the ladder.
- C** Un homme sort de l'eau avec l'échelle.
A man goes out of the water with the ladder.

In 6% of instances, the parallel also occurs between different constituents (e.g. a verb and a gerund in an optional constituent), e.g.

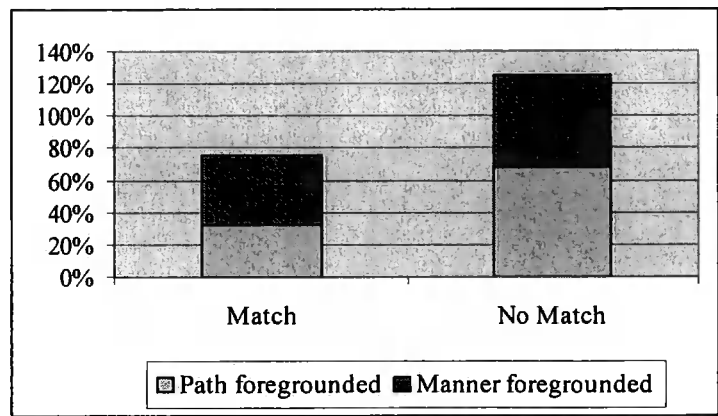
- Set [6] **A** Un homme descend les escaliers en courant de manière athlétique.
A man goes down the stairs running in an energetic fashion.
- B** Un homme descend une pente en trottinette.
A man goes down a hill on a scooter.
- C** Un homme court le long d'une piscine.
A man runs along a swimming pool.

Finally, in 1% of cases, the parallel occurs with similar noun phrases, typically in cases of nominalisation, e.g.

- Set [2] **A** Descente d'un escalier sur la pointe des pieds.
Descent of the stairs on tiptoes.
- B** Montée d'un escalier sur la pointe des pieds.
Ascent of the stairs on tiptoes.
- C** Montée d'un escalier le pied reposé en entier sur la marche.
Ascent of the stairs with his feet fully flat on the steps.

Finally, foregrounding information was done extensively in the French descriptions, as the above examples illustrate. Foregrounding was used both for PATH and MANNER information. According to Talmy, such linguistic foregrounding entails higher levels of salience of the foregrounded information – as already discussed in the English section. However, similarly to

the English descriptions, matching cases between association type of the nature of the foregrounded information do not obtain consistently (see Graph 6.16.).



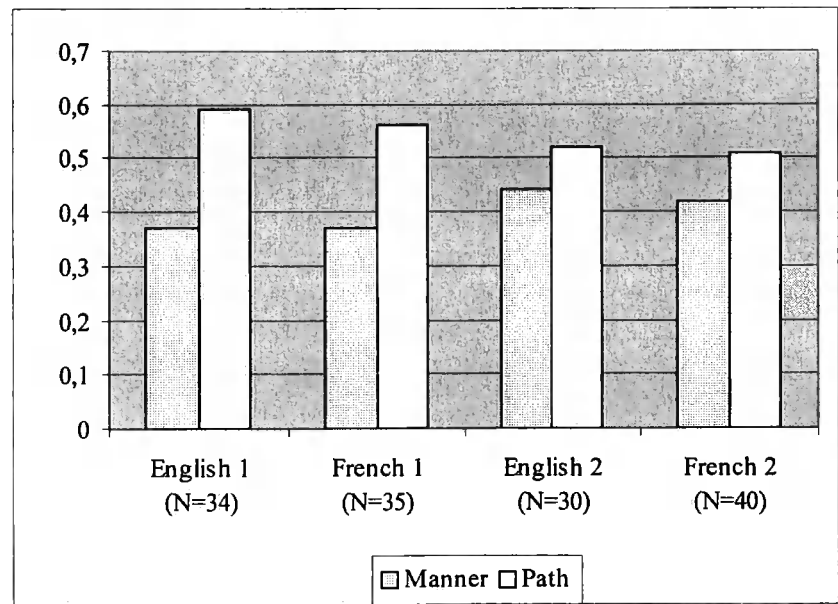
Graph 6.16. Cumulated proportions of matches between association type & linguistic foregrounding.

In fact, the added proportions of non-matches far exceed matching responses in the French sample; hence positively challenging the scope of Talmy’s notion of salience, in that linguistic foregrounding does not appear to induce cognitive salience of its semantic elements.

6.5. COMPARISON OF THE ENGLISH & FRENCH SAMPLES

6.5.1. ITEM ANALYSES

Each of the four experimental groups shows a clear preference for PATH associations overall, though MANNER associations are present consistently (see Graph 6.17.).



Graph 6.17. Cross-linguistic association patterns in Tests 1 & 2.

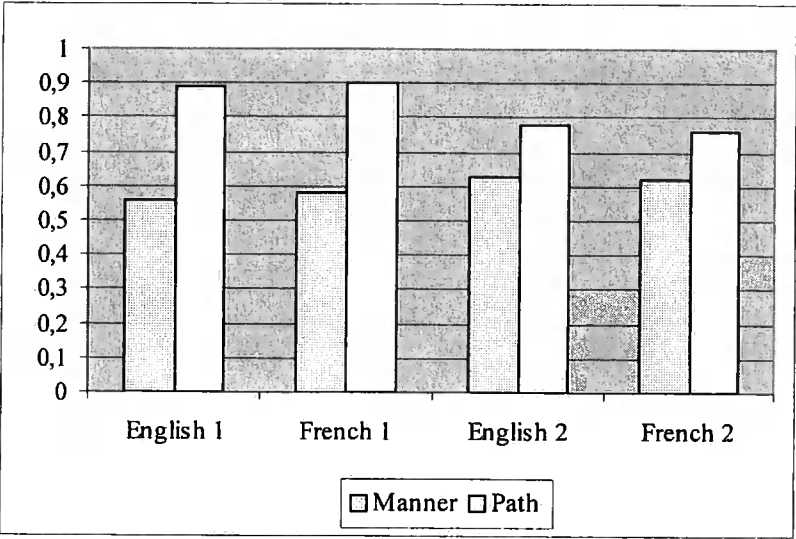
Score differences for MANNER and PATH are significant in the first experimental format only. Strikingly, the differences observed across all four groups are not based on the native language variable, but on the methodological design of the two tests. Indeed, both Groups 1 and both Groups 2 are closer in their performance patterns than the French groups and the English groups are. In other words, similarity of pattern seems to follow from the nature of the task rather than from the subjects' linguistic profile. Graph 6.17. indicates that preferences for PATH are marked only when no language elicitation is required prior to the task. Such elicitations blur the differences in associative performance.

From the item analysis, we may thus suggest a considerable task-on-task effect, whereby the explicit use of language prior to a sorting test alters responses. It seems plausible to infer some psycholinguistic interference in the second experimental format, and to therefore conclude that language does influence cognitive behaviour to an extent. This type of influence does not appear to be congruent with relativistic predictions, however, as the direction of the data is identical in both language groups, tending towards equipotential salience levels. It is more likely, therefore, that the extra task in Test 2 required heightened attentional levels to the various motion schemas present in the stimuli, as a result of which a more balanced distribution of scores was obtained.

Overall, relativistic predictions fail to be confirmed from the present results, given the close resemblance between language group performance within the same experiment type.

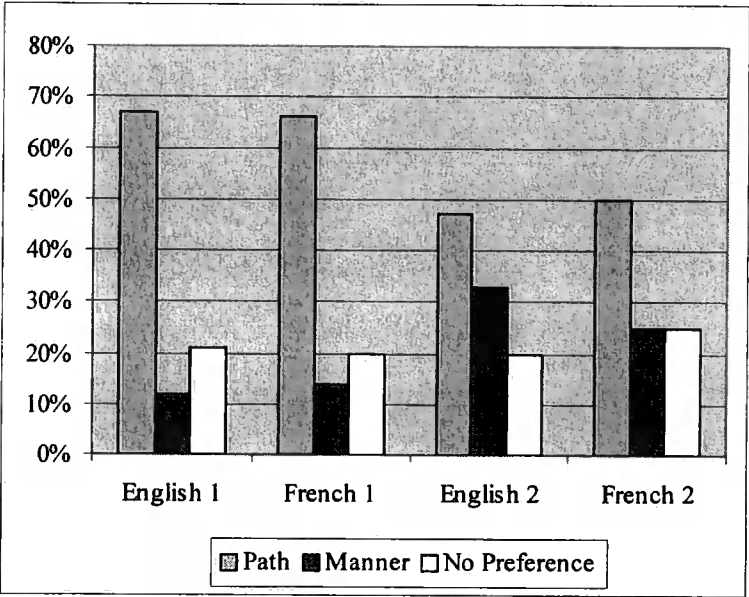
6.5.2. INDIVIDUAL PERFORMANCE ANALYSES

The analysis at the individual level is concordant with the item analysis and indicates an overall preference for PATH associations in all four tests (see Graph 6.18.). In the individual analyses, score differences between PATH and MANNER are significant in three experimental groups – both French and English Groups 1, and the French Group 2 – meaning that, at the individual level, the PATH variable is significantly more salient than MANNER.



Graph 6.18. Subjects’ mean scores of associations in all four groups.

We therefore obtain clear dominance patterns at the individual level for PATH responses, though these dominance patterns are much less marked for both the English and the French Groups 2 (see Graph 6.19.). Again, test format strongly indicates variability in response patterns.



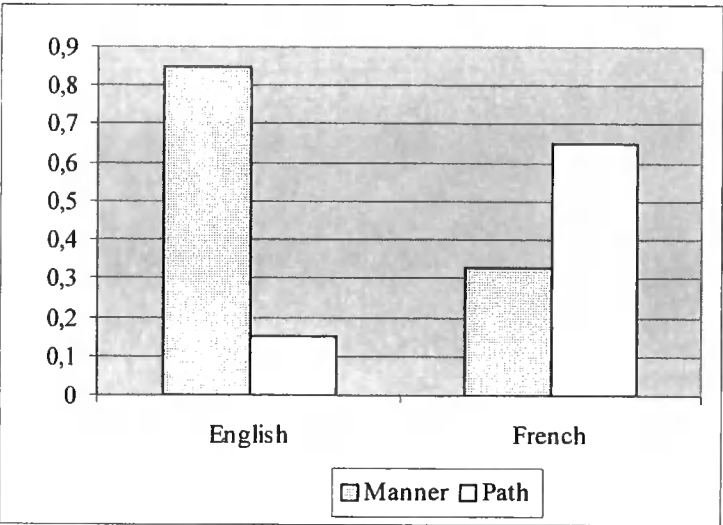
Graph 6.19. Cross-experimental dominance patterns.

The previous sections also showed these dominance patterns plotted against individuals’ linguistic knowledge besides their native tongue. The analyses were inconclusive in all four groups. It appears that the nature of subjects’ language(s) is not a variable impacting on performance in the present tests.

Overall the individual analysis agrees with the item analysis in the conclusions and suggestions to be drawn from this batch of data. None of this test supports relativistic possibilities.

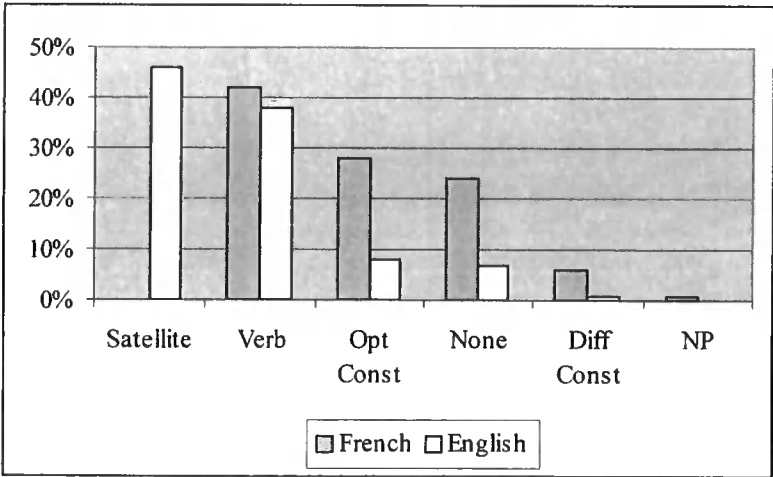
6.5.3. LINGUISTIC ANALYSES

The linguistic data elicited in Test 2 yielded different patterns across both language groups (see Graph 6.20.).



Graph 6.20. Proportions of MANNER & PATH SRs encoded in main verbs.

As shown above, despite these linguistic distinctions, cognitive performance remained similar across language groups. However, each triad of descriptions was analysed individually in order to cross-reference whether subjects chose pairs matching in the linguistic elements used to describe them. The aim of the analysis was to identify whether one particular grammatical category triggered language-based responses. A comparative summary of this analysis is illustrated in Graph 6.21.

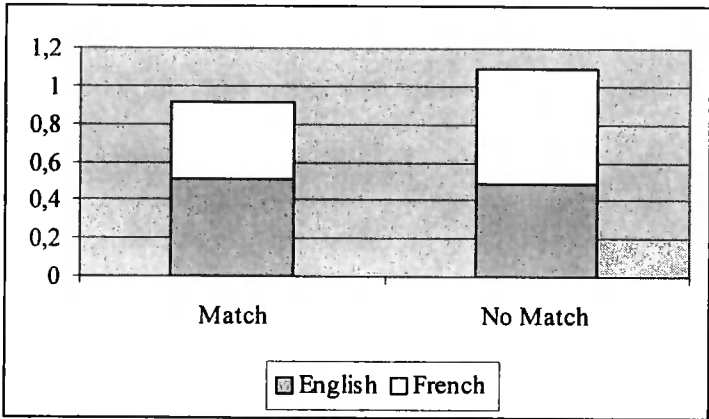


Graph 6.21. Proportion of matches between similar linguistic elements & association type.

The graph suggests that subjects from both native languages display linguistic matches correlating with association type, so that those linguistic matches correspond to matching verbs in some 40% of instances, or to satellites or optional constituents in a considerable number of

cases. The information encoded in main verbs, satellites, and optional constituents typically relates to either PATH or MANNER details. It is thus not surprising to find such correlations. Yet, by no means are they indicative of subjects using their language elicitation as tools to resolve the sorting task. In other words, these correlations may be incidental. Overall, the balanced distribution of correlations across grammatical categories suggests that the presence of a CR in one or the other category does not necessarily entail its higher cognitive salience relative to that particular category. For instance, the information encoded in the main verb does not appear to become more salient than the information present in the satellite, simply by virtue of being encoded by the verb.

This suggestion was further tested with regards foregrounded and backgrounded information. Recall that, according to Talmy (1991), information in the verb complex is backgrounded, whereas that in optional constituents is foregrounded in cognisers’ attention. To test Talmy’s predictions on salience, only the sentences displaying optional constituents were examined for correlational analysis. As shown in previous sections, none of the analyses were indicative of the greater salience of foregrounded information (see Graph 6.22.).



Graph 6.22. Cumulated proportions of matches between association type & linguistic foregrounding.

6.6. SUMMARY

The present experiments have failed to yield relativistic conclusions. One likely reason is that the stimuli contrasted absolute types of MANNER, e.g. RUN versus WALK, rather than fine-grained types, e.g. WALK versus STROLL. Indeed, the physico-motor properties of e.g. WALK, RUN, CYCLE, DIVE, KICK are too distinct not to be equally noticeable by any human subject. In addition, both language types comprise lexical verbs for such basic MANNERS of motion, hence any of those MANNERS is likely to be habitually conceptualised by the two language groups. On the other hand, distinctions within the one type of MANNER are more subtle and are not equally

codable by the two languages. It is with regard to fine-grained MANNERS that French and English fundamentally differ – besides structural mapping – as discussed and illustrated in section 5.1.2.2. This early research thus suffers from a lack of consideration to lexical resources and their ready codability. As such, its data seems to merely illustrate that French and English speakers are equally able to distinguish e.g. WALKING from RUNNING, but it neither proves *nor* disproves any relativistic potential. Its design was ill-informed to fulfill its aims and elucidate the hypotheses set out in section 6.1.6. Based on this fundamental understanding, new experiments may be devised for a more accurate assessment of the relativity question.

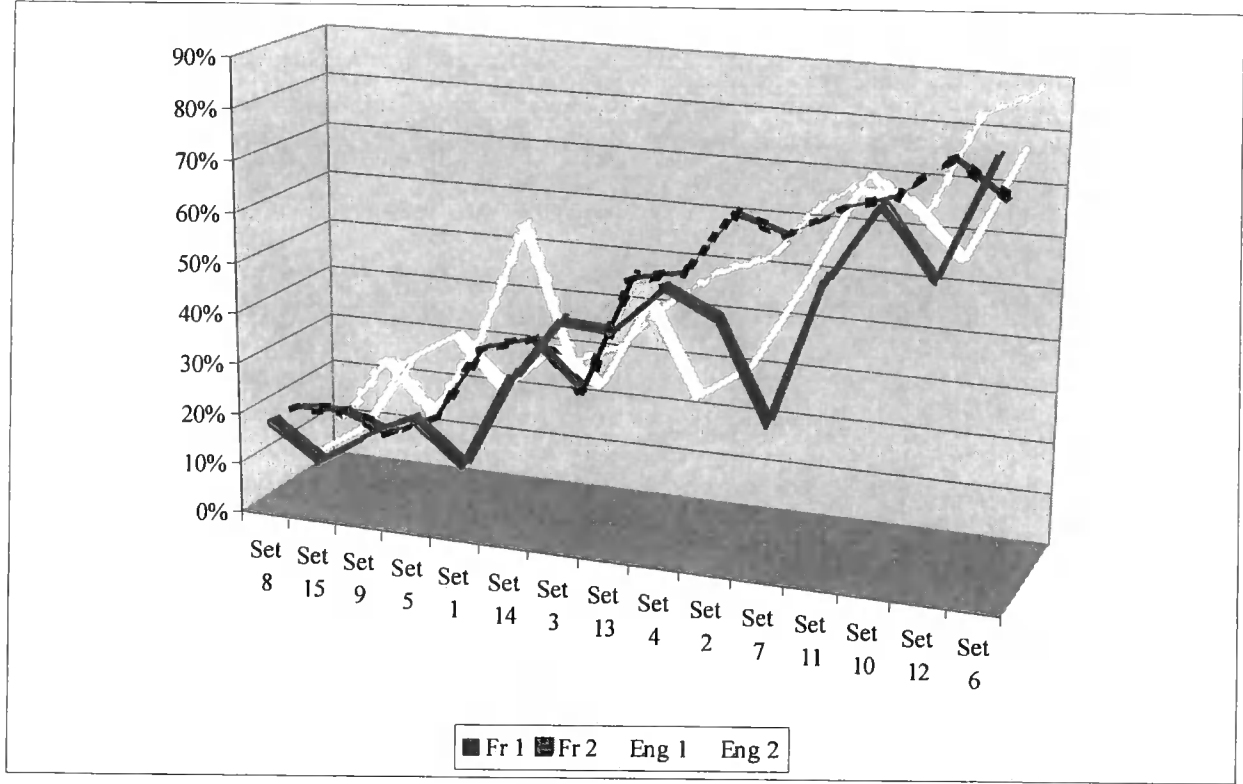
However, prior to doing so (see Chapter 8), Chapter 7 will further analyse the present data so as to attain a greater understanding of the intrinsic dynamics of the responses obtained. This endeavour springs from analytical needs – as already mentioned – as well as from epistemological requirements. Indeed, as suggested in section 3.2., epistemological approaches are more likely to be productive in terms of outcome when combined. Thus far, this research has attempted to combine a language approach and a reality approach, simultaneously departing from a main structural difference existing across two languages, and a specific experiential domain. Yet, the research so far discussed has mostly reflected the language approach, proceeding from the identification of cross-linguistic differences, the data collection and analyses of those differences, and the reliance on a linguistic framework of understanding for the devising of likely relativistic hypotheses, prior to designing tests for cognitive assessment (see section 3.2.2.1.). The reality approach has taken a theoretical only point of departure (see section 5.1.1.), and as such the domain of motion remains little understood in terms of its conceptual dynamics. Chapter 7 thus aims to return to a reality exploration of the domain of motion, independently of language, so as to sharpen an understanding of its schemas and those schemas' conceptual representation in speakers' minds – in universal and variable terms. The inconclusiveness of this early research thus further supports the suggestion made in section 3.2.3. concerning the likely necessity to combine epistemological approaches to maximise research efficiency.

CHAPTER 7. MOTION IN COGNITION

This chapter introduces a discussion of the findings reported in Chapter 6. As those findings appeared to be inconclusive in terms of relativistic evidence, the aim of this section is to pursue an investigation of those findings to establish what variables are patterning responses. The section starts with a new analysis at the item level. This analysis shows that responses rank consistently across items, and indicate variable dimensional salience of PATH and MANNER. The first sub-section contrasts the motion events in the stimuli items, and offers a correlated examination of PATH, MOTION, and MANNER types. This investigation identifies a few relevant schemas patterning the data consistently, namely PATH TELICITY, FIGURE ANIMACY, MOTION CAUSALITY, and MANNER FORCE DYNAMICS. The second sub-section aims to test those variables in order to confirm their relevance to motion conceptualisation. A new experimental test, using drawing performance from French and English subjects, is presented in detail in section 7.2. Overall, the findings confirm the predictions drawn from the schematic analysis of the categorisation experiments. Indeed, PATH TELICITY, FIGURE ANIMACY, MOTION CAUSALITY, and MANNER FORCE DYNAMICS crucially impact on overall conceptualisation and schema salience in motion events.

7.1. CATEGORISATION RESPONSE RANKING & DIMENSIONAL SALIENCE

One considerable aspect of the data, so far barely mentioned, is its variability at the item level. Responses are not random however, and a closer look indicates that this variability is internally patterned. Responses across test groups seem to correlate at the stimuli item level (see Graph 7.1.). Indeed, an examination of responses across stimuli sets shows that they rank similarly across language and test groups from barely 20% of MANNER associations (in e.g. sets [8] and [15]) to almost 90% of MANNER associations (in e.g. set [6]). This ranking is fairly consistent, at least across test groups, and deserves closer attention. This ranking indeed suggests that there must be *something* in the stimuli triggering differential salience.



Graph 7.1. Ranked MANNER responses.

In fact, it appears that responses may be explained in terms of the intrinsic properties of the stimuli. Given that all stimuli depicted motion scenes in which GROUNDS and FIGURES remained constant, these properties are not methodological but conceptual instead, and speak to discrete motion schemas, i.e. types of PATH and types of MANNER. The following sub-sections review those schemas, by sorting stimuli into conceptual categories, and correlating response types.

7.1.1. PATH TELOS

As pointed out by Aske (1989), and as detailed in Chapter 5, there are two distinct types of motion PATH, namely locative, e.g. (1), and telic, e.g. (2). TELIC PATH types entail the reaching of an endpoint or the crossing of a boundary (or the completion of a goal in caused motion), whereas locative, or atelic, PATH types do not, e.g.

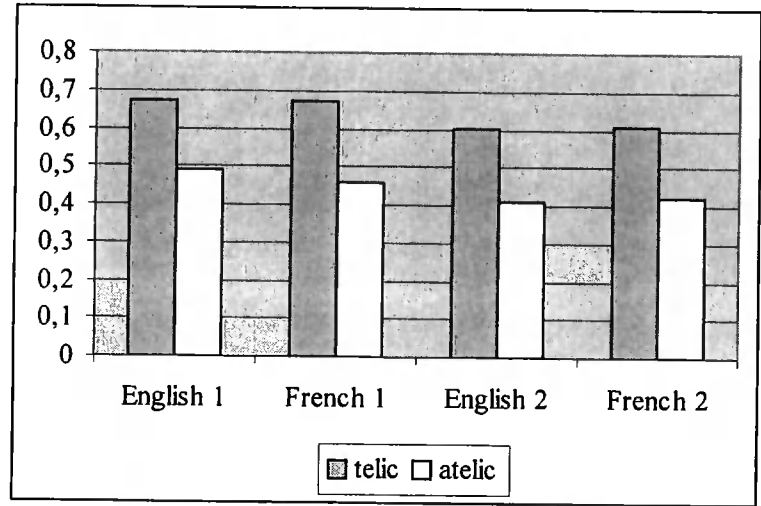
- (1) a. We walked along the beach.
- b. He cycled up the hill.
- (2) a. We walked into the room.
- b. She slid the window shut.

The present stimuli presented both types of PATH. Five triads contrasted ATELIC PATHS and ten triads contrasted TELIC PATHS (see Table 7.1.).

Table 7.1. Triad PATH types.

	TELIC PATHS (N=10)	ATELIC PATHS (N=5)
Set [1]	open – shut	up – down along (2) – across
Set [2]		
Set [3]		
Set [4]	off – on	up – down up – down
Set [5]		
Set [6]		
Set [7]	across (2) – along	towards – away
Set [8]		
Set [9]		
Set [10]	shut – open	
Set [11]		
Set [12]		
Set [13]	in – out	
Set [14]		
Set [15]		

When grouping responses based on the telic nature of the stimuli, a clear correlation is observable in all test groups (see Graph 7.2.).¹

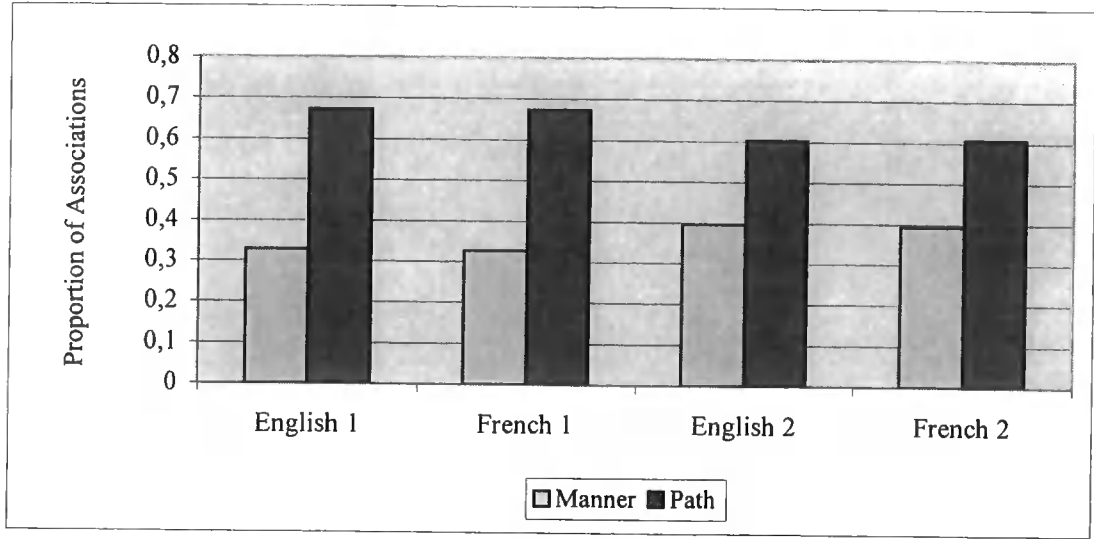


Graph 7.2. Proportions of PATH responses for TELIC & ATELIC stimuli.

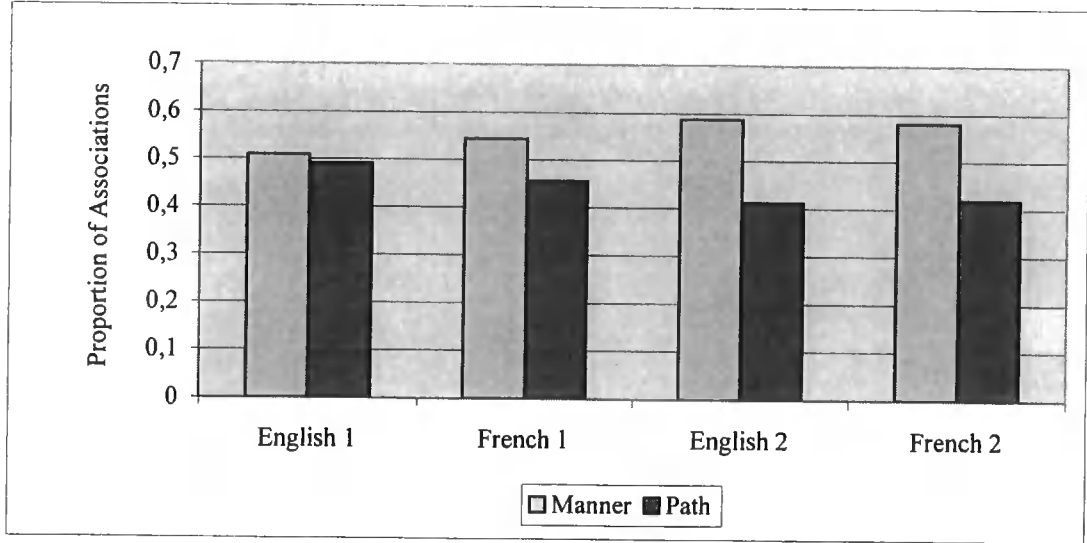
The graph indicates that PATH responses are favoured when PATH is telic. In other words, the correlation suggests that PATH is more salient in motion conceptualisation when it involves an endpoint, a crossed boundary, or a resultative state in the case of caused motion. TELICITY is thus a relevant schema in the analysis of the responses outlined in Chapter 6.

TELIC PATHS therefore trigger PATH preferences in motion categorisation (see Graph 7.3.). ATELIC PATHS, however, do not trigger MANNER preferences to the same extent – as may be expected (see Graph 7.4.).

¹ Note as well that response patterns are similarly emphasised in Test 1, and likewise attenuated in Test 2 – an observation already noted in Chapter 6.



Graph 7.3. Proportions of PATH & MANNER responses for TELIC stimuli.



Graph 7.4. Proportions of PATH & MANNER responses for ATELIC stimuli.

Graphs 7.3. and 7.4. show the separate analyses of PATH and MANNER responses for telic and for atelic triads. In telic stimuli, the preference for PATH categorisation is strongly marked, i.e. >20% in both test groups. In atelic stimuli, however, where a reversed preference for MANNER may be expected, the difference between PATH and MANNER choices is less marked, e.g. some 2% difference in the English₁ sample of responses.² This suggests that lack of TELICITY does not suppress PATH salience (still >40% in all groups); instead, it merely reduces PATH salience. This possibility is highly likely if we accept the understanding of motion events outlined in Chapter 5, according to which PATH defines the conceptual core of motion events.

² The differences are more marked in Group 2, who performed under the language-primed condition. As noted in Chapter 6, the added task of writing explicit descriptions of the stimuli might have called for greater attention to all the dimensions in each stimulus, crucially resulting in greater notice of MANNER details. This would explain the greater proportions of MANNER pairs in Group 2 in all the analyses. As such, the differences are not less marked; instead, they suggest stronger attention to MANNER overall. However, such a suggestion needs further investigation.

7.1.2. AGENT ANIMACY & INTENTIONALITY

The question now becomes one in search of the motivations behind the greater salience of PATH and TELICITY. Objectively, human agents, such as those present in the stimuli, rarely undergo motion randomly, that is, using random or arbitrary MANNERS of displacement to reach random locations. That is because human behaviour – and animal behaviour in general – is goal-driven. Human displacement and motion are typically purposeful actions carried out with an intention in mind. That intention may be to perform a particular activity entailing a specific MANNER of motion, e.g. CYCLING, JOGGING; or to reach a particular destination following a given PATH, i.e. a spatial endpoint. Importantly then, human – or animate – motion presupposes agent intentionality. In the case of a motion event stimulus – as opposed to an activity – understanding that event requires the identification of the intentionality of the moving agent. As just noted, that intent is translated in the destination, or PATH ENDPOINT. In motion events, PATH therefore constitutes the goal- or intentionality-loaded schema (whereas in activities, it is the MANNER that constitutes the defining schema). As such, PATH is likely to be more cognitively salient than MANNER when conceptualising motion events. The point is that the end justifies the means, and this suggests that the means, or the MANNER of motion in this case, are only secondary in human motion events. The cogniser's question is thus not *what is the agent doing?*, but instead *where is the agent going?* It is insightful to consider subjects' debriefing comments on those very points. Subjects were asked to justify PATH and RESULT choices of association, e.g.

- (3) He's doing the same action, going along the road and through a door.
- (4) He's hiding something; the manner is irrelevant because the object he's got, he's doing the same action with it in two of them [film stimuli] although he doesn't do it in the same manner. The overall picture is that he places something under the sofa, as opposed to he's kneeling down twice and standing once. That's the overall *result* picture.

I suggest, therefore, that agent intentionality, as conceptualised through PATH, overrides the notion of MANNER (or CAUSE) in conceptualising motion events, as a general rule. This possibility would justify the findings reported in Graph 7.4., among others. In the case of a decontextualised task, such as the present tests, it is possible that subjects found an even greater need to reconstruct, or simply to identify or infer, agent intentionality in order to make sense out of the stimuli, and out of the task overall.

It follows that when PATH ENDPOINT, and hence intentionality, are overt – that is, the goal or endpoint is visible – then PATH receives greater cognitive salience than MANNER. And vice versa, when PATH ENDPOINT and agent intentionality are not readily observable or inferrable,

then PATH receives lesser cognitive salience. We can now predict that when PATH ENDPOINTS and agent intentionality are unclear, MANNER is then granted higher cognitive salience.

MANNER is thus unlikely to ever be the most cognitively salient element in human motion event conceptualisation. On the other hand, PATH may *always* be salient, unless it is ATELIC and agent intentionality is difficult to infer. This suggestion may be valid only to the extent that the motion agent is HUMAN, or at least ANIMATE, on two grounds. First, intentionality is a cognitive ability requiring a cerebral creature. Indeed, inanimates, such as objects, may not be perceived as undergoing or initiating intentioned motion with purposeful PATH ENDPOINTS. At best, inanimates may follow specific PATHS based on their intrinsic properties, e.g. boomerangs. Yet, in this case, PATH is constrained rather than intended. Secondly, cognisers, e.g. test-subjects, arguably conceptualise reality – including motion events – based on their embodied experience of that reality. This entails that, in the present experiments, subjects' responses informing their conceptualisation of the stimuli matched expectations from their own self-projected experience of the motion events. As such, their responses might have differed had the moving agent been non-human, e.g. animal or object – though MANNERS and PATHS of motion might have remained the same. Indeed, the natural human tendency to self-project entails that empathy on an intentional level is possible so long as the self-projection recipient conforms to the original, i.e. it has to be animate, and human ideally. This possibility would predict that similar experiments on non-intentioned moving agents, e.g. inanimate agents, would fail to reproduce the PATH salience reported in the present research. This is indeed the case with the study reported by Zlatev & David (2004), in which computer-generated – albeit smiling – tomatoes were used to perform motion events (see section 4.4.). In other words, we should expect PATH salience to override MANNER salience if the FIGURE is animate and human-like in its ability to perform intentioned motion events (see Kopecka & Pourcel 2005 for supporting data).

7.1.3. MOTION ACTUALITY & CAUSALITY

It is possible to consider motion types as having 'actuality' features, in that a motion may be physical or actual as in (5), or a motion may be caused as in (6), e.g.

(5) The horse jumped over the fence.

(6) Anna kicked the door open.

In actual motion, MANNER and PATH are effected by the same FIGURE, e.g. *the horse* in (5). In caused motion, on the other hand, there are two moving FIGURES, and one FIGURE initiates the motion of the other by performing some MANNER 'upon' it. That is, FIGURE A enacts the MANNER of motion, and FIGURE B undergoes motion as a result. PATH in this case becomes a resultative

endstate, and applies to FIGURE B only. In (6), *Anna* corresponds to FIGURE A, and *the door* to FIGURE B. The PATH, or RESULT, is the *open* endstate, and bears on *the door*, i.e. FIGURE B.

Structurally, satellite-framing of the RESULT is the typical lexicalisation pattern applied to CAUSED MOTION in English, as in (6), and verb-framing of the RESULT is the typical lexicalisation pattern applied to CAUSED MOTION in French, e.g.

- (7) Anna ouvrit la porte d'un coup de pied.
- Anna opened the door with a kick.

Talmy's (1985) typology thus conflates together MANNER and CAUSE, and PATH and RESULT. Yet, the conceptual difference between actual and caused motion is obvious, and differing cognitive responses may be expected in categorisation tasks depending on motion actuality.

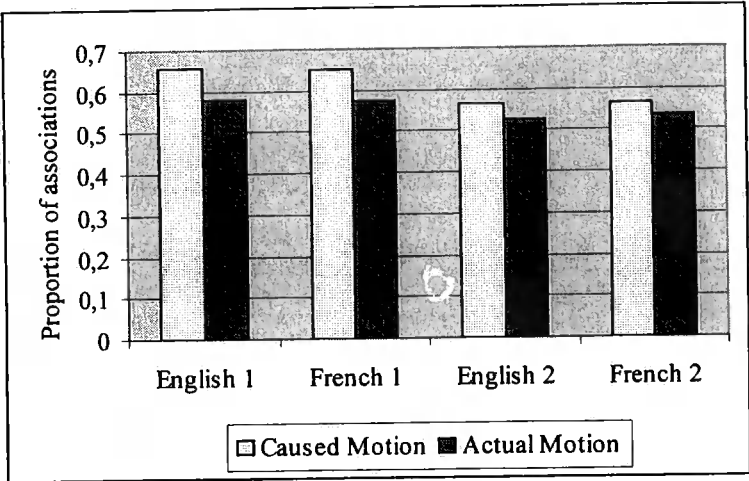
The present experiments offered both types of motion stimuli. Six triads contrasted CAUSED MOTION events and nine triads contrasted ACTUAL MOTION events (see Table 7.2.).

Table 7.2. Triad MOTION types relative to ACTUALITY & CAUSALITY.

	CAUSED MOTION	ACTUAL MOTION
Set [1]*	open – shut	
Set [2]		up – down
Set [3]		along – across
Set [4]*		
Set [5]*		across – along
Set [6]	off – on	up – down
Set [7]		up – down
Set [8]*		in – out
Set [9]*		across – along
Set [10]		towards – away
Set [11]*	shut – open	
Set [12]*		in – out
Set [13]*		
Set [14]*		
Set [15]*		

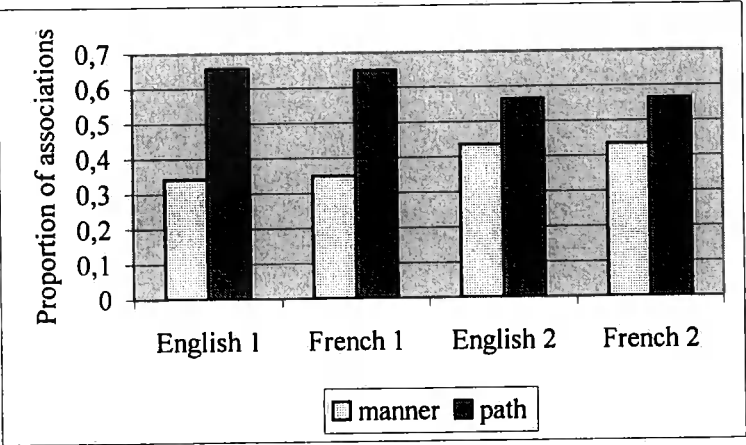
(* indicates telic triads.)

When grouping responses based on the actuality/causality nature of the stimuli, a mild correlation is observable in all test groups (see Graph 7.5.), so that causality triggers heightened PATH salience. Contrasting PATH responses for either type of motion does not yield any significant interaction, however.

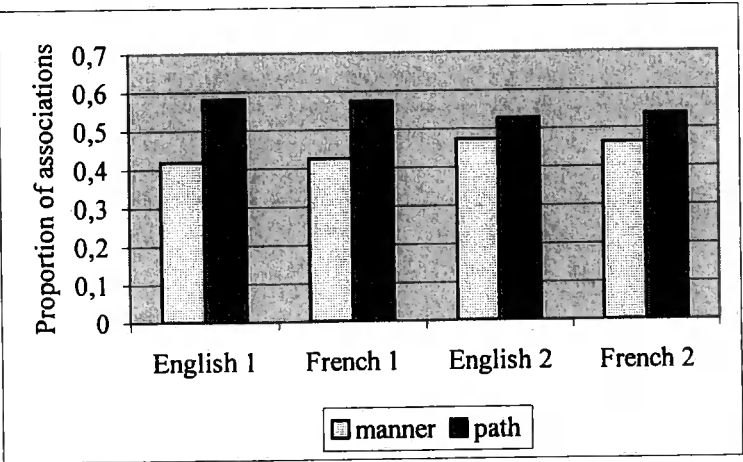


Graph 7.5. Proportions of PATH responses for CAUSED & ACTUAL MOTION stimuli.

Graph 7.5. suggests that causality may exert a marginal influence only on the relative salience of the PATH schema in the conceptualisation of motion events. However, contrasting PATH and MANNER response types relative to causality renders the correlation more emphasised (see Graphs 7.6. and 7.7.).

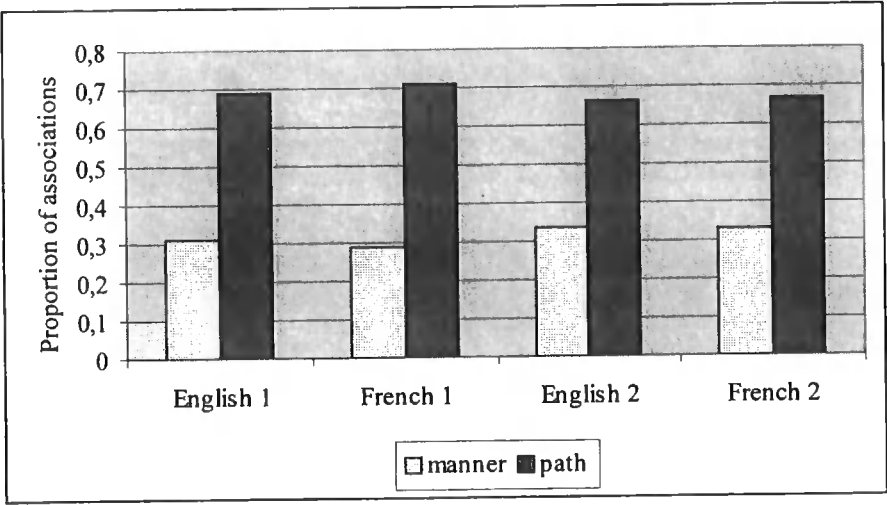


Graph 7.6. Proportions of PATH & MANNER responses for CAUSED MOTION stimuli.



Graph 7.7. Proportions of PATH & MANNER responses for ACTUAL MOTION stimuli.

The correlation appears to be relatively considerable when taking into account response type relative to MANNER as well as to PATH. In CAUSED MOTION stimuli, the preference for PATH categorisation is strongly marked, i.e. up to 30% in Test 1. In ACTUAL MOTION stimuli, however, the difference between PATH and MANNER choices is reduced to about 15% in Test 1. This suggests that the presence of CAUSALITY increases PATH salience significantly. This possibility is highly sensible given that all CAUSED MOTION events are also TELIC. As discussed in section 7.1.2., PATH salience is particularly emphasised when agent intentionality is overt. In ACTUAL MOTION, the prediction is therefore that TELIC SPATIAL ENDPOINTS increase PATH salience in conceptualisation. In CAUSED MOTION, the prediction would entail that overt ENDSTATES increase PATH salience accordingly. CAUSALITY, however, somewhat emphasises agent intentionality all the more, as MOTION is merely instrumental in achieving a specific RESULT. One may thus expect even higher PATH salience in CAUSED MOTION than in ACTUAL TELIC MOTION events. The stimuli comprised four triads of ACTUAL TELIC MOTION events (see Table 7.2.). All four involved the crossing of boundaries, including small boundaries, such as doorways, and larger boundaries, such as roads. PATH and MANNER responses for those isolated triads are illustrated in Graph 7.8.



Graph 7.8. Proportions of PATH & MANNER responses for ACTUAL TELIC MOTION stimuli.

Graph 7.8. indicates that our recent prediction does not hold, as PATH and MANNER responses for ACTUAL TELIC MOTION differ to a substantial average of 40% in Test 1. Before drawing concluding remarks from these results, it is important to examine further schemas and their influential role in the variable conceptualisation of motion events, as only the PATH schema has been discussed so far.

7.1.4. MANNER FORCE DYNAMICS

Turning to MANNER types, we may posit that there exist a tremendous number of MANNERS of motion that the human body is capable of performing. These MANNERS differ depending on various aspects, such as the body part(s) used, extra instrumentalities or vehicles, force dynamics, inherent directionality, the presence of an axis, actual displacement, agent intentionality, and so on.

In this small-scale study, the stimuli have only been classified in three broad categories of FORCE features, namely DEFAULT, FORCED, and INSTRUMENTAL MANNER types. DEFAULT MANNER types refer to the expected MANNER for performing a given motion, such as WALKING or RUNNING for human self-motion, or e.g. PUSHING, PULLING, SLIDING, PICKING for causing an object to move, depending on its intrinsic properties, e.g.

(8) Grandpa walked into the house.

(9) He pushed the door open.

FORCED MANNER types, on the other hand, involve some conscious and intentional effort or some form of physical impediment in performing motion, so that the MANNER of motion entails a level of control or difficulty in performance, such as HOPPING, SKIPPING, KICKING, THROWING, LIMPING, BOUNCING, MARCHING, WALTZING, ZIGZAGGING, e.g.

(10) She tiptoed up the stairs.

(11) She kicked the door shut.

Finally, INSTRUMENTAL MANNER types involve an extra element besides the human body used to perform the motion, such as CYCLING (involving a bike), ROWING (involving a boat), BALLOONING (a balloon), SKATING (skates), DRIVING (a vehicle), and so on, e.g.

(12) We skied down the slope.

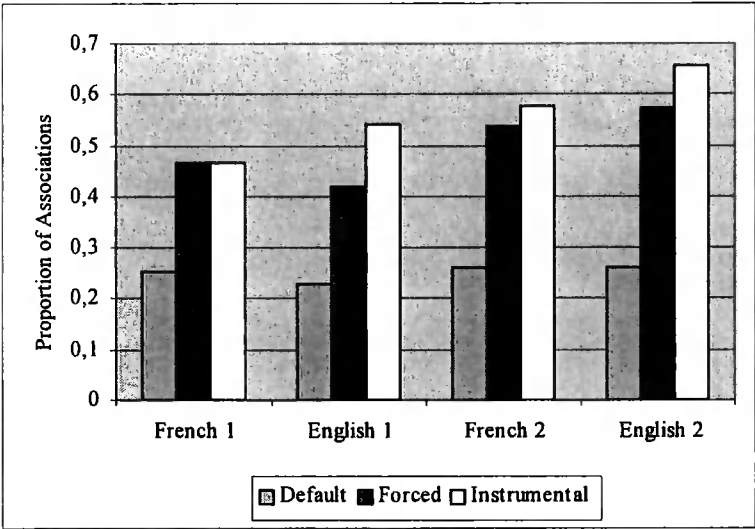
(13) The crew rowed the boat into the bank.

The experimental stimuli comprised all three MANNER types. Five triads contrasted DEFAULT MANNER types; six triads contrasted FORCED MANNER types; and four triads contrasted INSTRUMENTAL MANNER types (see Table 7.3.).

Table 7.3. Triad MANNER types.

	DEFAULT MANNER	FORCED MANNER	INSTRUMENTAL MANNER
Set [1]	slide – pull		
Set [2]		tiptoe – walk	
Set [3]	walk – run		
Set [4]		blow – switch	
Set [5]			cycle – run
Set [6]			scooter – run
Set [7]			cycle – walk
Set [8]	walk – run		
Set [9]	walk – run		
Set [10]		limp – walk	
Set [11]		kick – push	
Set [12]			climb – dive
Set [13]		kiss – wave	
Set [14]	throw – put		
Set [15]		kick – push	

A neat and consistent correlation is obtained between DEFAULT MANNER types and low MANNER scores on the one hand, and FORCED and INSTRUMENTAL MANNER types and higher MANNER scores on the other hand (see Graph 7.9.).³

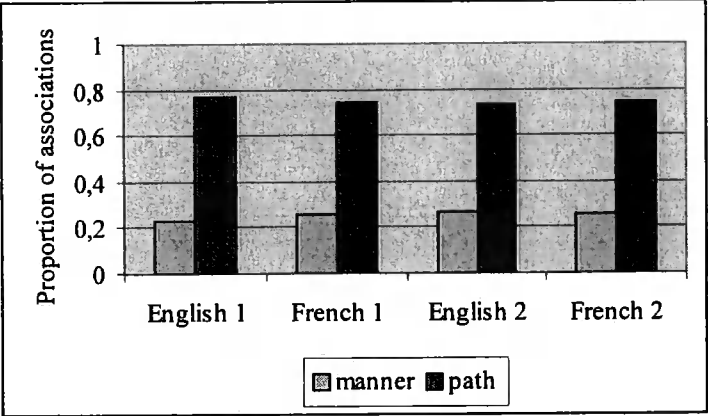


Graph 7.9. Proportion of MANNER responses in DEFAULT, FORCED, & INSTRUMENTAL stimuli.

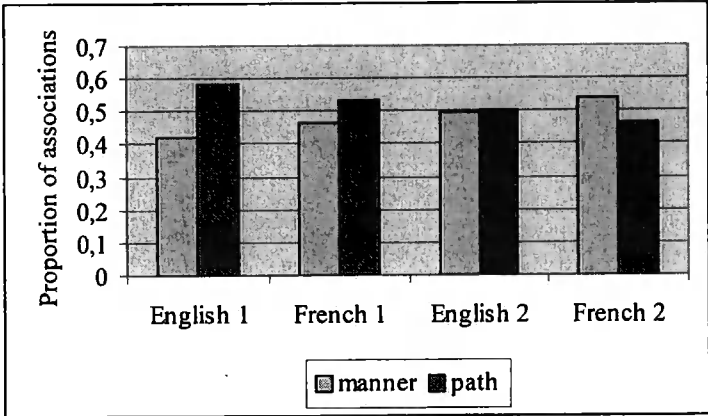
Graph 7.9. thus suggests that the more DEFAULT the MANNER of motion, the less salient MANNER is in conceptualising the motion event. Interestingly, the correlation appears to be consistent across all test groups despite the small number of items in each category ($N_d=5$, $N_f=6$, $N_i=4$).

³ PATH and MANNER score differences are statistically significant when DEFAULT MANNER types are displayed in the stimuli ($R_{E1d}=40$, $N_d=5$, 5 , $p=0.008$; $R_{E2d}=39$, $N_d=5$, 5 , $p=0.016$; $R_{F1d}=40$, $N_d=5$, 5 , $p=0.008$; $R_{F2d}=31$, $N_d=5$, 5 , n.s.).

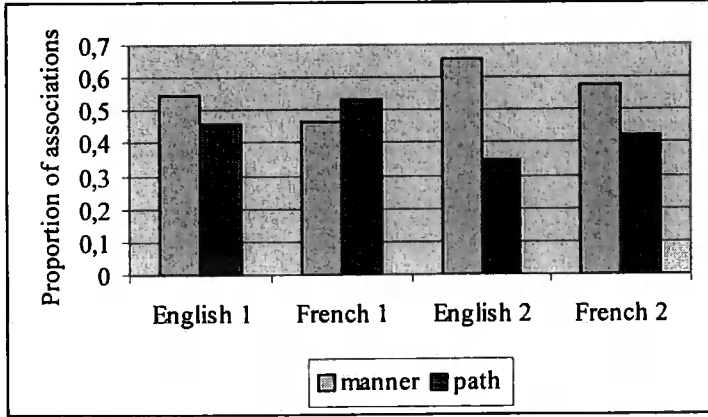
Graph 7.10. illustrates more forcibly the low cognitive salience of MANNER when it is DEFAULT. Graph 7.11. suggests that MANNER and PATH appear to be given relatively equivalent cognitive salience when MANNER is FORCED, though PATH remains favoured in Test 1. Finally, Graph 7.12. indicates that preference patterns come to be reversed in INSTRUMENTAL MOTION, so that MANNER is slightly more cognitively salient than PATH when MANNER is INSTRUMENTAL.⁴



Graph 7.10. Proportion of PATH & MANNER responses in DEFAULT stimuli.



Graph 7.11. Proportion of PATH & MANNER responses in FORCED stimuli.



Graph 7.12. Proportion of PATH & MANNER responses in INSTRUMENTAL stimuli.

⁴ Note again that cases of MANNER salience are more clearly obtained and more consistently so in the second experimental format, i.e. when explicit language is used in the task – as already mentioned in preceding sections.

These graphs are based on a small number of triads. However, they indicate very divergent conceptual dynamics, and suggest that MANNER types are highly relevant schemas in cognising motion. It is possible that in the present controlled conditions of testing, subjects found MANNER particularly salient when FORCED or INSTRUMENTAL, as such instances may have violated their default expectations for motion performance. On the other hand, as mentioned in section 7.1.2., it is also possible that subjects self-projected on the moving FIGURES, and empathised to a greater extent with events requiring a level of difficulty in performance, e.g. LIMPING. However, such a suggestion does not account for the high levels of MANNER salience in INSTRUMENTAL cases. Finally, it may simply be that FORCED and INSTRUMENTAL MANNERS are more physically 'visible,' hence subjects notice them more consistently than they notice DEFAULT MANNERS. Some introspective insights into such conceptual salience, as obtained during debriefing, express the idea as follows:

- (14) The limping is very emphasised; it is blatantly obvious that he is limping in a harsh way.

This latter possibility is paralleled in the English mapping of DEFAULT MANNER CRs onto SRs, as MANNER verbs are often omitted in such mappings, using neutral verbs of motion instead, e.g. *go*, *come* (see section 5.1.3.8.).

7.1.5. SUMMARY

The identification of the above features as factors of influence on dimensional salience in motion conceptualisation enables cognitive predictions for behaviour combining PATH TELOS, FIGURE ANIMACY, MOTION CAUSALITY, and MANNER FORCE DYNAMICS. It has been suggested that [+TELIC PATH], [+ANIMATE FIGURE], [+CAUSALITY], and [+DEFAULT MANNER] features favour PATH salience in motion conceptualisation. On the other hand, [-TELIC PATH], [-ANIMATE FIGURE], [-CAUSALITY], and [-DEFAULT MANNER] lessen PATH salience in favour of higher MANNER salience levels. In the case of ANIMATE FIGURES – as in the present stimuli – we may elaborate the following predictions regarding the interactions of the other three variables:

- (15) [+TELOCITY] [-CAUSALITY] [+DEFAULT] = high PATH salience
- (16) [+TELOCITY] [+CAUSALITY] [+DEFAULT] = high PATH salience
- (17) [-TELOCITY] [-CAUSALITY] [+DEFAULT] = high PATH salience (though lower than in (15)-(16))⁵
- (18) [+TELOCITY] [-CAUSALITY] [-DEFAULT] = mixed PATH salience and MANNER salience

⁵ Note that the present study did not comprise any ATELIC CAUSED MOTION. Such motion events exist, e.g. PUSHING A PRAM ALONG. The prediction may be one of high PATH salience, though lower than that expected in case (16).

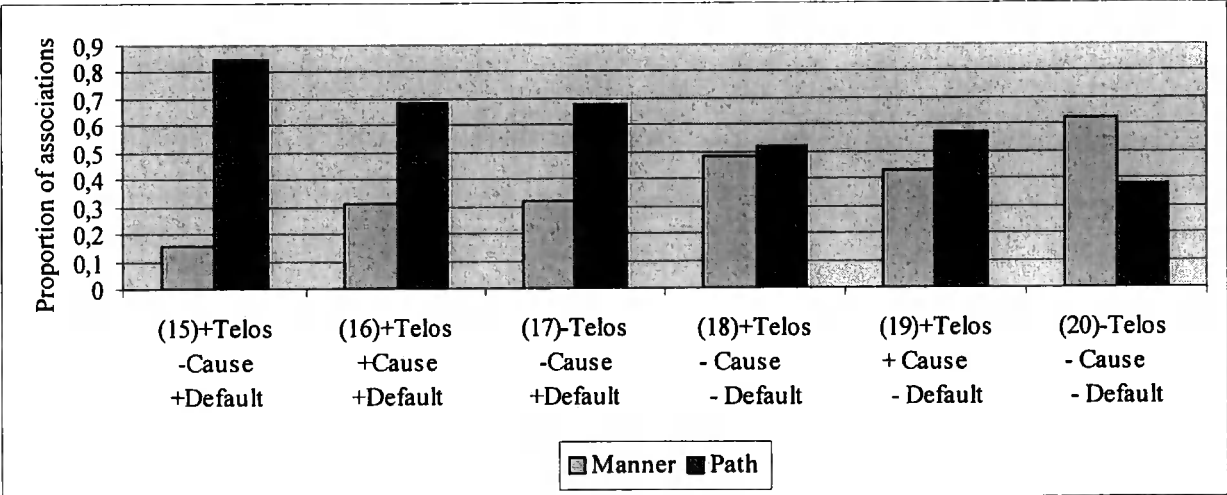
- (19) [+TELICITY] [+CAUSALITY] [-DEFAULT] = mixed PATH and MANNER salience
- (20) [-TELICITY] [-CAUSALITY] [-DEFAULT] = higher MANNER salience

We may thus re-categorise the stimuli to correspond to these predictions (see Table 7.4.).

Table 7.4. Categorisation triad types.

	PATH TELICITY	MOTION CAUSALITY	DEFAULT MANNER
Set [1]	+	+	+
Set [2]	-	-	-
Set [3]	-	-	+
Set [4]	+	+	-
Set [5]	+	-	-
Set [6]	-	-	-
Set [7]	-	-	-
Set [8]	+	-	+
Set [9]	+	-	+
Set [10]	-	-	-
Set [11]	+	+	-
Set [12]	+	-	-
Set [13]	+	+	-
Set [14]	+	+	+
Set [15]	+	+	-

According to this classification, two triads correspond to prediction (15) – i.e. [8] and [9]; two triads correspond to (16) – i.e. [1] and [14]; one corresponds to (17) – i.e. [3]; two correspond to (18) – i.e. [5] and [12]; four correspond to (19) – i.e. [4], [11], [13] and [15]; and four correspond to (20) – i.e. [2], [6], [7] and [10]. The number of triads to test these predictions is greatly reduced; yet, the predictions are confirmed at this preliminary level (see Graph 7.13).⁶



Graph 7.13. Proportions of PATH & MANNER associations relative to FORCE, TELICITY, & CAUSALITY.

⁶ Results across test groups are now conflated, given their consistency in response types.

It therefore appears, at a preliminary glance, that what makes PATH cognitively salient in motion conceptualisation is PATH TELICITY, MOTION CAUSALITY, DEFAULT MANNER types, HUMAN FIGURES, and, as suggested in 7.1.2., overt agent intentionality. These variables influence conceptualisation in a generic sense, that is, regardless of the subjects' native language.

7.2. MOTION CONCEPTUALISATION THROUGH DRAWING

Now that basic schemas influencing motion conceptualisation generically have been identified, it is possible to fine-tune experimental formats, e.g. stimuli, tasks, so as to target a more complex level of conceptualisation, where linguistic construals may be hypothesised to impact on more discrete aspects of motion conceptualisation. Such tests would, for instance, focus on one type only of variables, e.g. TELIC PATHS, DEFAULT MANNER types, and introduce finer granularity of e.g. TELICITY, DEFAULT MANNERS of motion. Such experiments are introduced in the next chapter. Prior to such investigations, it appears relevant, however, to confirm the validity of the predictions made in the previous section, i.e. (15)-(20). To this end, the present section offers new tests on overall conceptualisation and perceived salience of motion dimensions via drawing tasks. To ensure the validity of the generic nature of basic dimensional, the tests were comparative, using subject samples whose native languages are again English and French.

7.2.1. METHODOLOGY

Drawing was the chosen task for global conceptualisation and dimensional salience because, in drawing, subjects have to render the stimuli elements that they perceive to be salient so that drawings represent fair translations of the stimuli. In the case of filmed motion events, subjects have to render an unbounded, dynamic 3-D image onto a bounded, static 2-D format. This means that subjects must select the features relevant to their conceptualisation of the stimuli, and disregard others. For instance, MANNER of motion may be particularly difficult to draw, e.g. LIMPING, so that an attempt to render limping would entail that MANNER has been selected as a particularly salient feature of the stimulus. Likewise, PATH entails some change of location, and is therefore a dynamic concept that is not drawable in the sense that static entities are, e.g. GROUNDS. Therefore, subjects would have to add e.g. arrows or dotted lines – not seen in the stimulus – if they found PATH to be a salient feature of their conceptualisation of the stimulus. The selective and additive processes involved in making static drawings of dynamic scenes therefore appear to justify drawing experiments as pertinent to testing the relative salience of the dynamic variables in motion, e.g. PATH and MANNER.

7.2.1.1. Participants

As in the previous tests, all subjects were native speakers of either English or French, and used their native language predominantly in their daily encounters. Subjects were tested in their native country, and instructions were given in their native language. Subjects were tested individually, using laboratory and classroom facilities at Durham University (UK) and at the Université Lyon 2 (France).

Nineteen English native speakers took part in the test. All were in their twenties, except two subjects aged 34. All were engaged in intellectual occupations, either as students or as teachers – though none were psychologists. Seven were men, and twelve were women.

Twenty-five French native speakers took part in the test. Six were in their early thirties and all the others were in their twenties. All were engaged in intellectual occupations, either as students, researchers, or as teachers – though none were psychologists. Eleven were men, and fourteen were women.

The two language samples are therefore highly comparable in terms of overall profiles (see Appendix F). Only one of the monitored profile variables seemed to affect performance, namely gender. Indeed, spatial management of the A4 piece of paper varied across men and women, with women often using corners of the sheet, and men placing their drawing more centrally, using the A4 space more fully. Women also tended to misrepresent proportions and sizes. These findings should not be surprising given the well-known cross-gender brain asymmetries with regards spatial manipulation. Other differences seemed more marginal, e.g. men would draw breasts on female agents, whereas women never did. On the other hand, both genders varied equally in the quality of their drawing, in the quantity of details drawn, and in the time they took to perform their drawings. Gender-based effects were inconsistent and seem overall to be irrelevant to the present focus on motion variables.

7.2.1.2. Ethics

Ethical concerns were followed, similarly to the categorisation procedure, using the same consent forms (see Appendix A). Consent forms were filled prior to proceeding with the task. No subject objected to taking part or to having their drawing performance analysed and used for scientific purposes.

7.2.1.3. Stimuli

The film stimuli used in this task were taken from the forty-five silent video clips films in the categorisation task (see section 6.1.4.). These films depicted real-life motion scenes performed by HUMAN FIGURES, and lasted a few seconds long. None of the subjects had performed the categorisation task, and therefore, none were familiar with the stimuli.

This experiment asked subjects to produce drawings of five of the video clips, as follows:

- (21) A MAN RUNNING DOWN TO THE BOTTOM OF A FLIGHT OF STAIRS.
- (22) A MAN JOGGING ALONG A STREET AND INTO A HOUSE.
- (23) A MAN LIMPING TOWARDS A WOMAN SAT DOWN ON A SOFA.
- (24) A MAN KICKING A DOOR SHUT.
- (25) A MAN DIVING INTO A SWIMMING POOL.

All forty-four subjects drew the five scenes, hence obtaining 220 drawings of motion scenes ($N_E=95$, $N_F=125$).

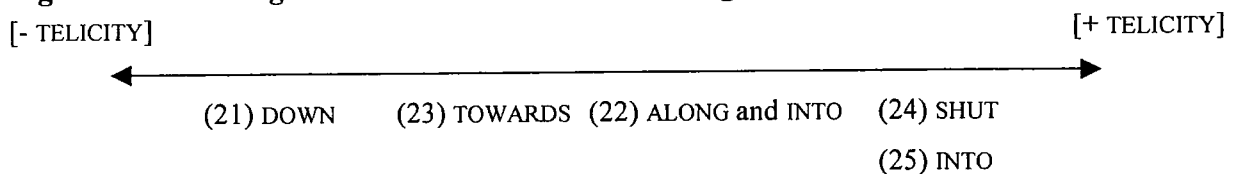
In terms of the variables identified in section 7.1., the stimuli in (21)-(25) may be analysed as shown in Table 7.5..

Table 7.5. Drawing triad types.

	PATH TELICITY	MOTION CAUSALITY	DEFAULT MANNER
(21)	+	-	+
(22)	+	-	-
(23)	- (?)	-	-
(24)	+	+	-
(25)	+	-	-

Upon closer examination, the films further displayed varying levels of granularity in terms of TELICITY and FORCE DYNAMICS. Relative to TELICITY, the films may be ranked as shown in Figure 7.1.

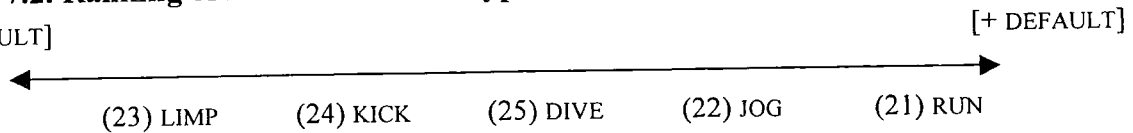
Figure 7.1. Ranking of PATH TELICITY in the drawing stimuli.



The ranking is based on the TEMPORALITY of the PATH followed (as discussed in section 5.1.3.6.), and on the overt nature of the MOTION ENDPOINT or GOAL. Hence (23) is hypothethised to involve greater TELICITY, as the FIGURE's GOAL is especially overt, as well as being ANIMATE. Likewise, (22) is hypothethised to involve a lesser degree of TELICITY than (25) as the PATH involves PROGRESSIVE TEMPORALITY prior to the BOUNDARY-CROSSING event.

It is equally feasible to rank MANNER types along a granular axis of FORCE DYNAMICS (see Figure 7.2.).

[- DEFAULT]



7.2.1.4. Hypotheses

The axes in Figure 7.1. and 7.2. thus mirror the hypotheses, so that the closer the PATH type is to the [+TELIC] end, the more attempts should be made to render PATH, and the closer the MANNER type is to the [-DEFAULT] end, the more attempts should be made to draw MANNER. Note that in the case of MANNER, the prediction may run against intuition, as the less default the MANNER, the harder it may be to translate via drawing, e.g. LIMP. Finally, we may hypothesise an error margin based on this methodological feature, that is, subjects may render KICK or DIVE more consistently than LIMP, due to the ease of drawing.⁷ Overall, then, the idea is that the elements drawn will be those perceived as cognitively salient, and thus as necessitating translation onto paper to achieve a representative drawing of the stimuli.

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7.2.1.5. Procedure & Instructions

The procedure consisted of watching one video clip, twice if desired. Subjects were provided with A4 sheets of paper, a rubber, and seven colour pencils. Pencils were numbered from (1) to (7), so that

- (26) (1) corresponds to grey,
(2) corresponds to blue,
(3) corresponds to brown,
(4) corresponds to green,
(5) corresponds to pink,
(6) corresponds to yellow, and
(7) corresponds to red.

Subjects were told that more colours were available if they exhausted the stock of pencils. They were instructed to draw the first element with pencil number (1), the second element with pencil (2), and so on. For instance, if the first element they wished to draw was a sun, then their sun would be grey, and if the second element was an elephant, then it would be blue. They were told that colours should match the order of drawing, rather than the real colour of the elements. The purpose of introducing this colour scheme was to monitor the order in which elements were drawn, e.g. FIGURE, GROUND, etc. It was also hoped that this added task would distract the subjects from identifying the purpose of the task, and would therefore entail more 'natural' performance.

Instructions were as follows:

I am going to show you a very short scene on the TV. You can watch it twice if you want. Your job is to draw the scene on paper. I am not looking for an artistic performance – a basic drawing will do. Now, each time you want to draw a different element in the scene, I'd like you to use a different colour pencil. Pencils are numbered and you have to follow the order. You can take as much time as you want. Overall, you'll watch five scenes, and so you'll make five drawings.⁸

Instructions further checked for understanding, and clarification was often given about the pencil numbering system via examples, such as the one provided above. Finally, subjects were invited to ask questions during the task if required. Such questions often related to pencil changes.

⁸ French instructions: "Je vais vous montrer une scène très courte à la télévision. Vous pouvez la voir deux fois si vous voulez. Votre mission est de faire un dessin représentant ce que vous avez vu. Un dessin tout simple, c'est très bien. Chaque fois que vous voulez dessiner un nouvel élément de la scène, je voudrais que vous preniez un crayon différent. Les crayons sont numérotés et j'aimerais que vous suiviez cet ordre. Vous pouvez prendre autant de temps que vous désirez. Et en tout, il y a cinq scènes et donc cinq dessins à faire."

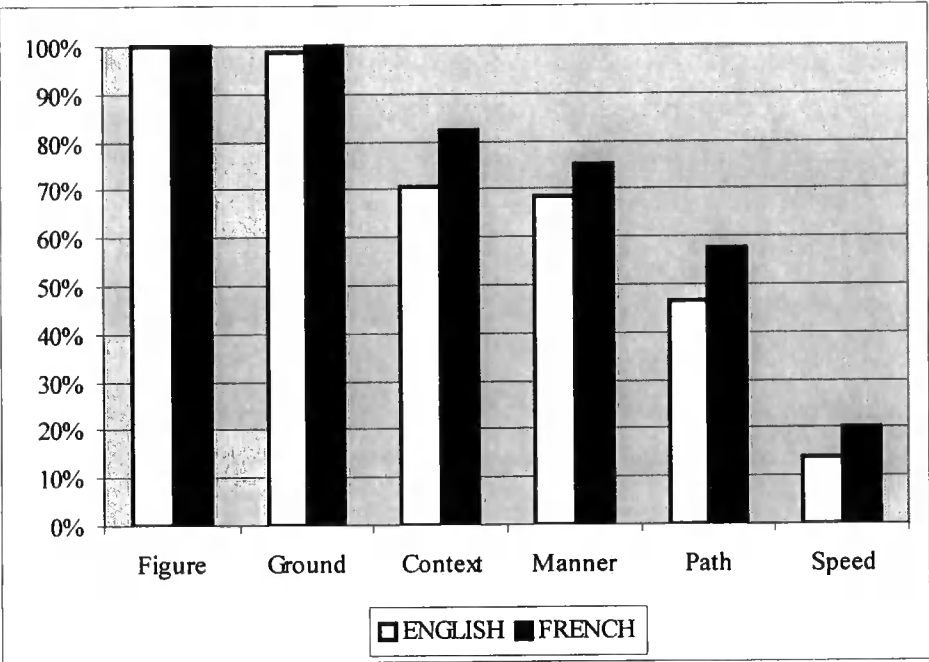
Experiment time length varied depending on the subject, though it never exceeded 25 minutes.

7.2.1.6. Summary

In sum, the present experiment used non-linguistic stimuli in order to gather non-linguistic data speaking to the dynamic conceptualisation of motion-internal schemas. Assuming that the predictions drawn from the categorisation results are correct, this task should confirm the validity of differential schematic salience based on motion properties. Such an understanding contributes to providing an in-depth investigation of motion as a reality domain, independently of language. This understanding is fundamental prior to the further exploration of language influences on motion conceptualisation. In the present experiment, the hypotheses are therefore the same for both language groups.

7.2.2. RESULTS

As predicted above, few differences were observed across language groups in the drawing of MOTION elements (see Graph 7.14.), hence rendering the performance of French and English subjects highly comparable overall.



Graph 7.14. Proportions of MOTION elements drawn.⁹

Overall, Graph 7.14. indicates clearly that MANNER and PATH are the two variables subject to selective encoding, in this case in the drawings, together with extra scene elements besides basic

⁹ 'Speed' refers to the drawing of e.g. parallel lines behind the FIGURE to show the speed or rate of motion. Also, 'context' is distinct from GROUNDS, in the sense that it involves the drawing of any para-motion element, e.g. sunshine, palm trees, wall pictures, and so on.

GROUNDS (i.e. context), and further MANNER specification (i.e. speed). The motion FIGURE and GROUNDS are systematically drawn. In fact, they are the first elements to be drawn – the FIGURE predominantly so.

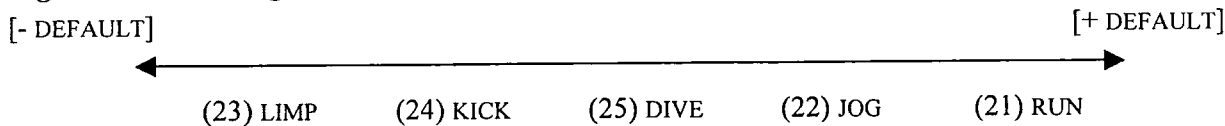
A cross-language group difference is notable too with regards the quantitative aspect of element drawing. Indeed, the French group drew more elements than the English group overall. However, this difference is consistent, approximately equalling 9% in the four variables showing divergences, i.e. CONTEXT, MANNER, PATH, and SPEED. Hence, we may suggest that the difference is not suggestive of language influences, but instead of group style. Thus, it is possible that the addition of extra subjects would level out those slight discrepancies. Overall, therefore, subjects performances are highly comparable across language group – as in the categorisation task.

The experiment was, however, particularly useful to assess the relative distribution of drawn elements per variable – especially with regards MANNER and PATH types – as indicative of variable salience levels. As such, the task was designed to test the predictions in (15)-(20) (see section 7.1.5.).

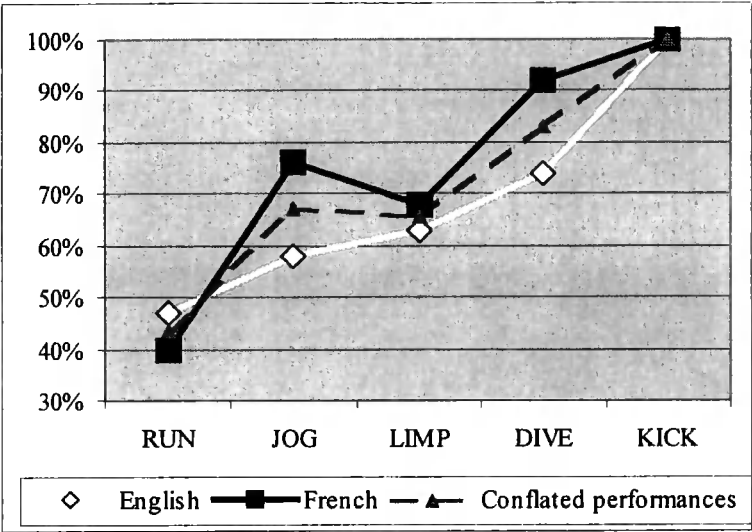
7.2.2.1. MANNER Analysis

As indicated in Figure 7.2., the MANNER types displayed in the five video stimuli displayed a gradation in FORCE features, which was hypothesised to be reflected in parallel salience ranking of the corresponding types.

Figure 7.2. Ranking of DEFAULT MANNER types in the drawing stimuli.



Ironically, drawing DEFAULT MANNER types, e.g. RUNNING, is easier than drawing FORCED MANNER types, such as LIMPING, which may encourage results going against the predictions. However, the reverse was observed, so that subjects' performances strongly confirmed the FORCE-based predictions for MANNER salience in conceptualisation (see Graph 7.15.).



Graph 7.15. Proportions of MANNER types drawn.

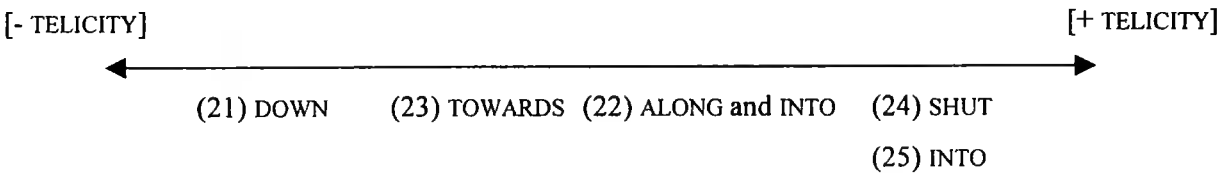
Graph 7.15. shows marked differences between the drawing of [+DEFAULT] and [-DEFAULT] MANNER types, with the latter more consistently drawn by both samples of subjects. Overall, the prediction is confirmed; however, not in the case of LIMPING, which was hypothethised as involving greater salience than KICK and DIVE. It is possible that subjects found KICKING and DIVING easier to draw than LIMPING. Hence, they may not have attempted to render LIMPING as systematically as they might have wished, due to the added difficulty involved in drawing it. This is a mere suggestion, however, and it would prove insightful to test subjects on drawing other [-DEFAULT] MANNER types involving drawing difficulty, e.g. TIPTOE, STRIDE, DANCE.

At this stage, it is not altogether clear why French and English subjects differed substantially in their rendering of DIVING and JOGGING MANNER types. Indeed, the French drew both MANNERS to an extra 18% extent compared to the English sample (see section 7.2.2.3. for further discussion).

7.2.2.2. PATH Analysis

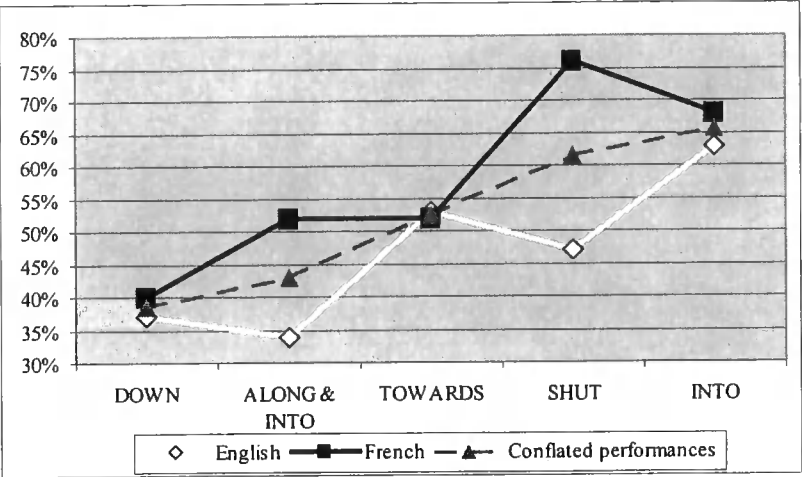
With respects to PATH, (15)-(20) predicted that TELIC PATH types would be drawn more consistently than ATELIC PATHS. Although all five video clips displayed TELIC MOTION events, a gradation in degree of TELICITY was noted in Figure 7.1.

Figure 7.1. Ranking of PATH TELICITY in the drawing stimuli.



Drawing performance, as indicative of conceptual salience, is thus expected to display less consistent drawing of PATH types showing a progression, e.g. ALONG, than of punctual or sudden

PATH types, with an obvious change of location or endpoint, e.g. INTO. Findings confirm that the more TELIC the PATH, the more salient it seems to be in cognition (see Graph 7.16.).

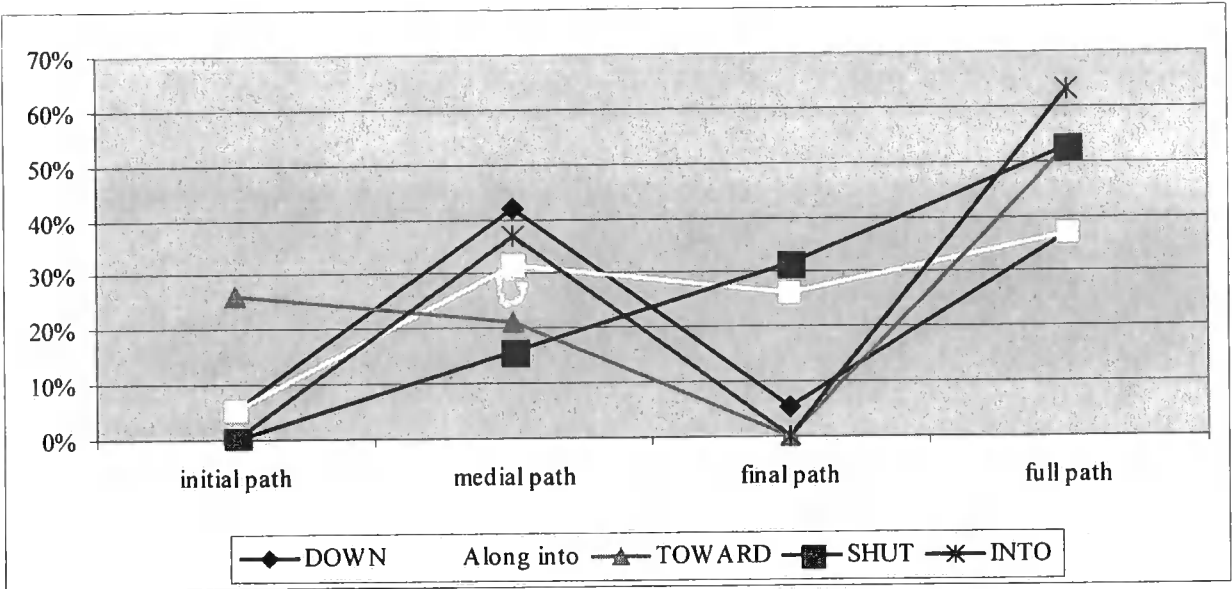


Graph 7.16. Proportions of PATH types drawn.

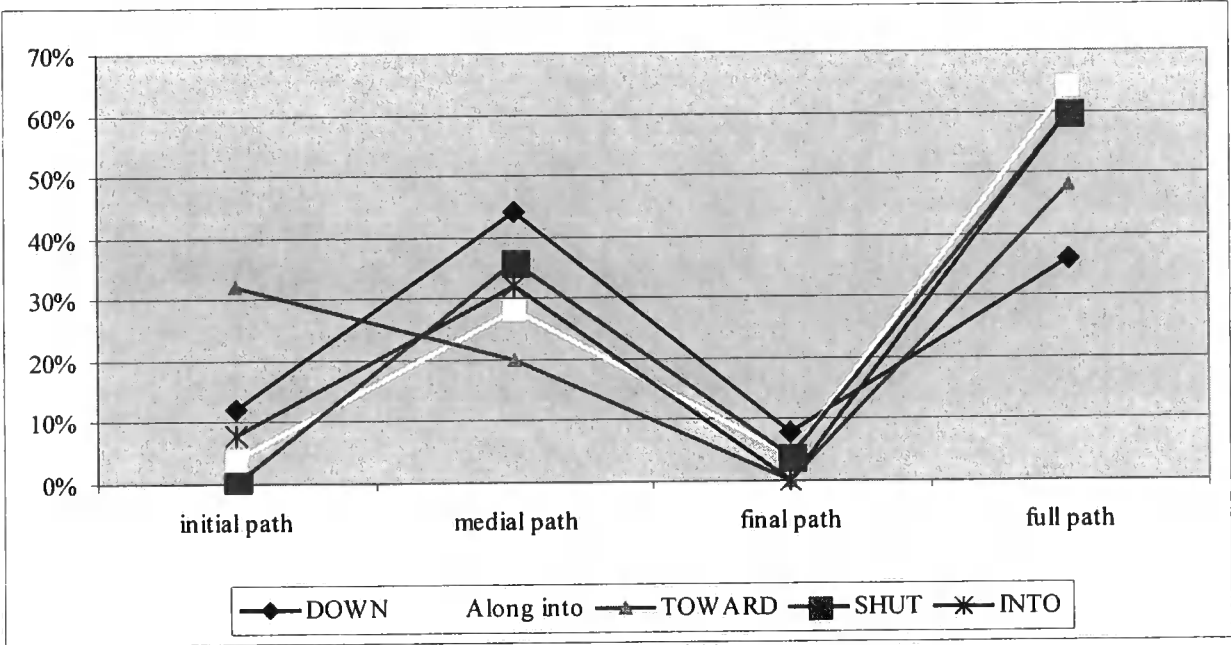
Graph 7.16. confirms this prediction, if we conflate the performance of both language groups together. In this case, the more TELIC the PATH, the more consistently and the more above-chance it is drawn.

Cross-language group differences are, however, markedly present in the case of the motion event involving an ATELIC PATH followed by a TELIC PATH, i.e. ALONG and INTO, and in the case of the CAUSED MOTION involving shutting a door. It appears that French subjects drew TELIC PATHS more consistently. Indeed, in the case of the double-PATH event, 42% of English subjects drew the ALONG segment, but only 26% added the INTO segment, whereas 52% of French subjects drew both ALONG and INTO.

To confirm this tendency, PATH POLARITY was analysed. This analysis involved examining the point at which subjects had drawn the FIGURE along the PATH taken, e.g. at the start (i.e. INITIAL PATH), in the middle (i.e. MEDIAL PATH), or at the end of the PATH (i.e. FINAL PATH). In addition, the analysis considered PATHS fully drawn, i.e. where the drawing reflects at once the INITIAL, MEDIAL and FINAL stages of the PATH. A FULL PATH may be drawn by using an arrow or dotted line tracing the PATH from start to finish, or by segmenting the FIGURE, that is, drawing the FIGURE (or a part of its body) several times to indicate the full progression of the MOTION PATH. Graphs 7.17. and 7.18. illustrate the use of POLARITY in the English and French drawings respectively.

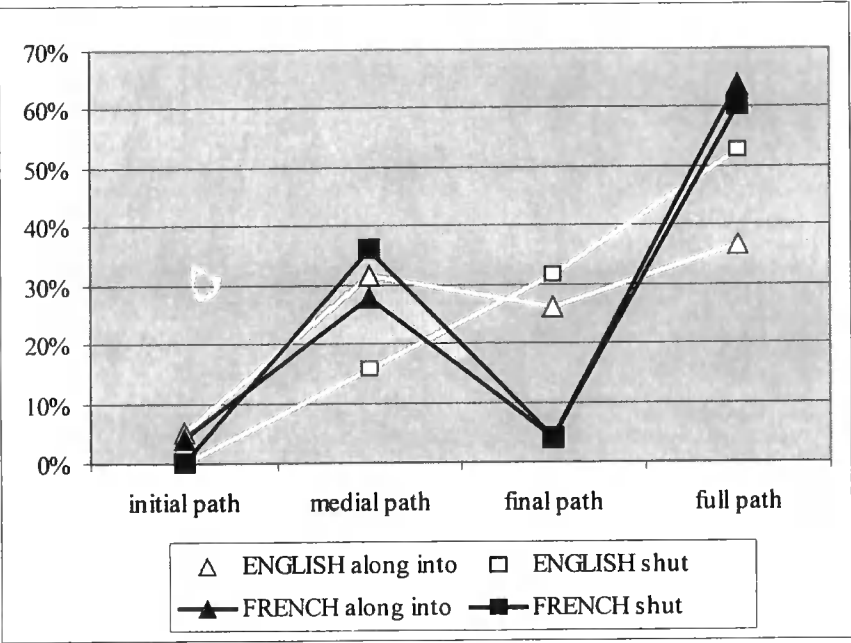


Graph 7.17. PATH POLARITY in the English drawings.



Graph 7.18. PATH POLARITY in the French drawings.

The performance of both groups, as shown in graphs 7.17. and 7.18., is highly comparable. When drawn, PATH is more often rendered in full (ranging between 36-64% of instances), or at the medial stage (ranging between 16-44%). PATH POLARITY is rarely represented at the initial and final stages only. Only in the case of TOWARD – in both groups – is PATH mostly initial-only (around 30% of the time). Final PATH only is represented in the English sample only in TELIC cases. It is precisely in those instances that the performances of the two language groups differ noticeably, as observed in Graph 7.16. above (see Graph 7.19).



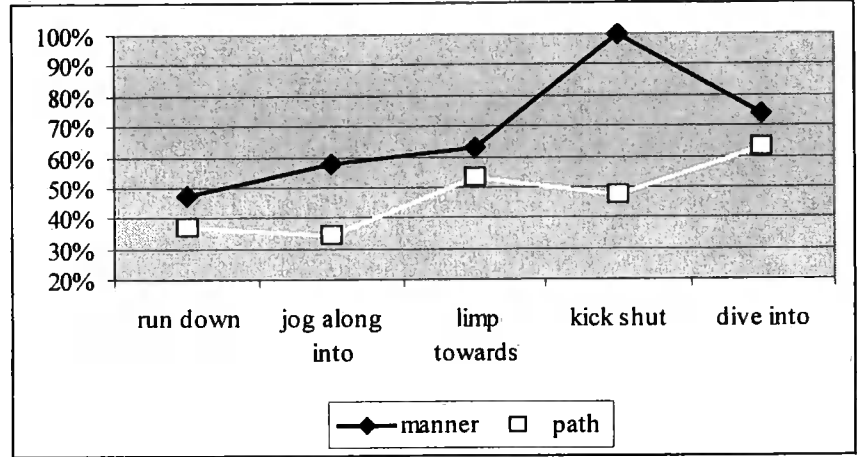
Graph 7.19. PATH POLARITY drawn.

Graph 7.19. indicates that the French sample drew TELIC PATHS in full more consistently (about 60% of the time). Drawing a full TELIC PATH entails rendering the ENDPOINT or ENDSTATE of the motion explicit. In the present cases, 64% of the French drawn PATHS showed the crossing of a doorway in the ALONG INTO event, and 60% showed both an open and a shut door in the CAUSED MOTION event. On the other hand, the English sample did not draw the TELIC element of those PATHS explicitly to the same extent. Instead, English subjects often used the final only portion of the PATH to leave TELICITY inferrable. For instance, the FIGURE is shown standing on the one side or the other of the doorway in the ALONG INTO event, and the viewer is left to infer the actual crossing of that doorway. Likewise, in the SHUT event, FINAL POLARITY shows the FIGURE's leg in the finishing portion of its PATH towards the either ajar or shut door, and the viewer can but infer that the door either was open before the motion, or will shut as a result of the motion. This finding needs further testing for confirmation. However, it is particularly interesting to consider it in the light of Slobin's comments on the English discursive style:

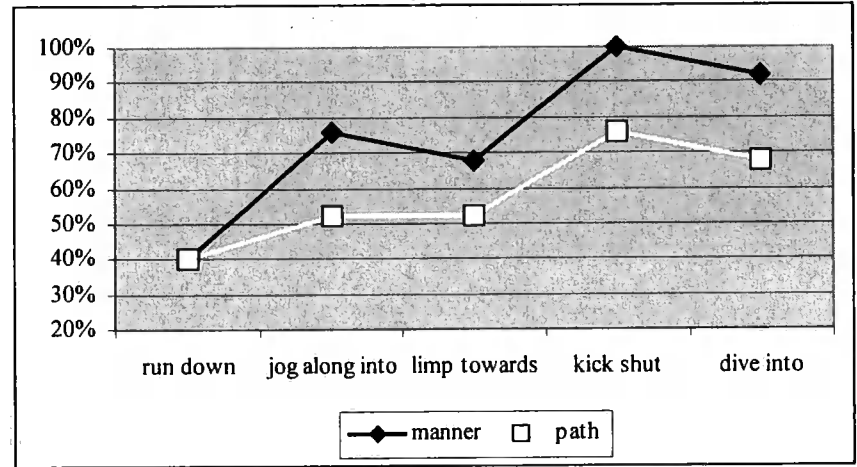
English tends to assert trajectories, leaving resultant locative states to be inferred...
English-speakers assert actions, implying results (Slobin 1996a: 84).

7.2.2.3. Motion Event Analysis

The above has suggested commonalities in conceptualisation across both groups, as well as significant differences in representing both MANNER and PATH. It is interesting to now consider the weighed conceptualisation of both variables together, as it may be possible that greater attention to the one variable may affect the level of attention granted to the other.



Graph 7.20. English drawing of MANNER & PATH in motion events.



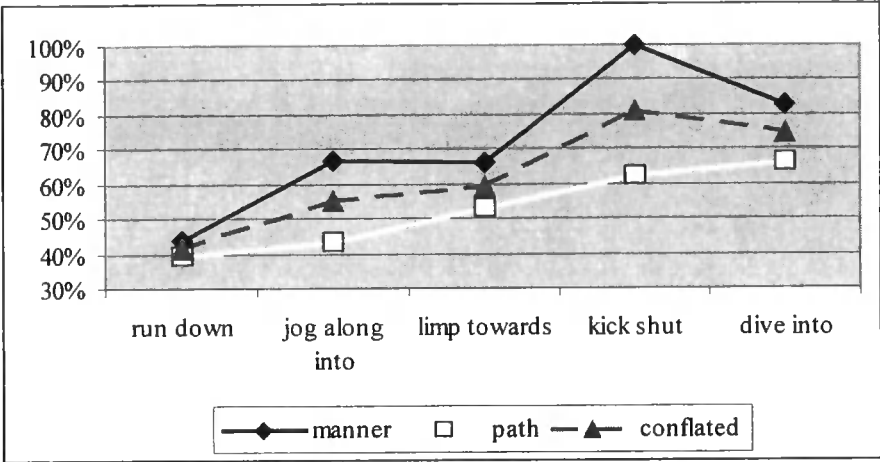
Graph 7.21. French drawing of MANNER & PATH in motion events.

Graphs 7.20. and 7.21. indicate that the English sample drew MANNER details more consistently than PATH segments, compared to the French sample, by an overall 4% extent. They further suggest that TELIC ENDPOINTS are less often drawn by English subjects, to the extent that the DIVE MANNER type is drawn 18% less by the English. Indeed, DIVING supposes TELICITY, whereas the other MANNER types do not. We may thus suggest that the cross-language group differences may be explained in terms of TELICITY. This would explain the divergence in MANNER and PATH drawing in the DIVING INTO motion event, as well as the divergence in PATH and RESULT drawing in the KICKING SHUT and JOGGING INTO motion events. This divergent conceptualisation of TELICITY might be justified in linguistic terms. Indeed, as mentioned in Chapters 4 and 5, the two languages profile TELICITY to differing extents, with Romance languages emphasising ENDPOINTS and leaving MANNERS covert, and English construing motion as temporal and dynamic events, hence emphasising MANNERS and DIRECTIONS, yet leaving ENDPOINTS covert to a greater extent than French (ibid.). Unexpectedly then, this experiment has brought to the fore relativistic potential, pointing to conceptual divergences across the two

language groups in terms of the very schema undergoing differing linguistic encoding in the subjects' native languages.

We may again resort to language habits to explain the divergence shown in the rendering of the JOGGING MANNER in the second stimulus, which the French drew to an increased 18% extent in comparison to the English. This state of affairs – along with the overall greater extent of MANNER drawing by the French sample (except in the default case of RUN) – may run counter to intuitions about the English language emphasis on MANNERS of displacement. Yet, as mentioned in previous chapters, both native speaker groups are equally capable of physiologically discerning and cognising differing MANNER types. The linguistic difference in French is that MANNER is left unsaid, unless it is atypical, i.e. NON DEFAULT, hence violating neutrality expectations, and suggesting some form of relevance to the motion type. In those atypical cases, French encodes MANNERS in an extra clause or sentence altogether. Such additions foreground MANNERS in attention, in a way that English does not achieve through MANNER encoding in concise verb complexes (c.f. Talmy's analysis of information backgrounding in the verb complex, 1985: 122). Assuming this much, we may then interpret the above graphs as reflecting those linguistic practices, with the French group rendering atypical MANNERS explicit in their drawings, as they would in language expression. In other words, MANNER may be all the more salient to the French group *because* such information is usually expected to be DEFAULT in their native language. I would further suggest that this should be especially the case in MANNER types that violate neutral expectations to a restricted extent only, e.g. JOGGING, as opposed to strongly atypical MANNER types, e.g. LIMPING. Indeed, JOGGING MANNERS are commonly encountered in everyday motion scenes and, as such, are encoded with relative frequency in English, whereas strongly NON-DEFAULT MANNERS, such as LIMPING, are atypical for both language groups, and are rarely expressed in language as a result, hence it may be perceived as violating both groups' expectations to a more equal degree (only 5% difference).

Overall, nonetheless, the conceptual trends across motion types seem to follow regular encoding. As such, they allow for the testing of the predictions, highlighted in (15)-(20), concerning motion variable salience in events. According to those predictions, we should expect dimensional salience especially in TELIC and NON-DEFAULT cases. This overall pattern of predictions is confirmed, so that MANNERS and PATHS are drawn in over 60% of motion event drawings when MANNERS involve some effort, and when PATHS are TELIC (see Graph 7.22.). The main divergences in the extent of drawing refer to FORCE and TELICITY scaling.



Graph 7.22. Conflated group drawing of MANNER & PATH in motion events.

7.3. SUMMARY

Given the inconclusive nature of the findings reported in Chapter 6, together with the lack of agreement between those findings and other research efforts on motion (see Chapter 4), the present chapter has attempted to examine the domain of motion conceptualisation independently of language. For this purpose, it has taken a closer look to the motion stimuli. Its aim has been to identify patterns in the conceptual organisation of those different motion events, and from there, to suggest pertinent schemas determining that conceptual organisation. The categorisation data has thus been re-analysed consistently for each suggested variable. Importantly, this section has been able to identify PATH TELICITY, MOTION CAUSALITY, and DEFAULT MANNER FORCE DYNAMICS as the conceptual schemas channelling PATH salience over MANNER salience in motion conceptualisation – conclusions for which is has also offered evidence via the categorisation and the drawing experiments, comprising 183 subjects altogether ($N_{cat_F}=75$, $N_{cat_E}=64$, $N_{dr_F}=25$, $N_{dr_E}=19$). This chapter has also ventured the suggestion that the FIGURE’s ability to entertain intentionality – therefore presupposing its animacy – may be responsible for the greater salience of PATH in TELIC, CAUSED, and/ or DEFAULT-MANNER motion events.

The categorisation data has thus been particularly useful in affording an in-depth understanding of the domain of motion in cognition; whilst the drawing data has allowed an evaluation of the new predictions drawn from that schematic analysis. The drawing data has confirmed the conclusions in section 7.1. However, the drawing experiment has also indicated unexpected differences in performance across language groups, as well as overall regularities. The discussion has suggested that these differences may be indicative of language effects. Though language effects were not sought in this test, the cross-language group differences have proved significant in particular instances, e.g. TELICITY. Such language effects will be the

subject of a renewed investigation of motion in language and cognition, as presented in Chapter 8.

Importantly, the present chapter has confirmed that an itemised analysis of motion types reveals differing schema-based conceptualisation of events. Research must therefore take those schematic considerations into account prior to investigating the domain of motion in language and cognition, with relativistic purposes. As such, Chapters 6 and 7 have demonstrated the usefulness of a thorough domain analysis, besides a linguistic analysis (see Chapter 5). As suggested in Chapter 3, combining a language and a domain approach to the study of relativity is likely to be more rigorous and productive overall.

CHAPTER 8. MOTION IN LANGUAGE & COGNITION: MEMORY

This chapter introduces new research on motion in language and cognition. In the present tests, the cognitive function under investigation is memory, and to a limited extent, inference. The first section details the methodological set-up of these tests. The second section reviews results in the first test, which consisted of an immediate free prose recall of the film stimulus; and the third section presents the findings in the second test, namely a late recognition task. Finally, the section ends with a summary of this new piece of research into linguistic relativity.

8.1. METHODOLOGY

For the memory experiments, French and English subjects were asked to view a short extract from a Charlie Chaplin film, following which they had to recall the scene verbally. Twenty-four hours later, subjects were presented with a questionnaire about the extract and had to perform a recognition task.

8.1.1. PARTICIPANTS

All subjects were either English or French native speakers. Most subjects had also taken part in the drawing experiment (see Appendix G). Subjects were tested in their native country, using laboratory and classroom facilities at Durham University (UK) and at the Université Lyon 2 (France). Subjects were tested individually, and instructions were given in their native language.

Twenty-two English subjects took part in the immediate free prose recall task, including eleven men and eleven women. Differences in performance were marginal, with men's average narrative length equalling 3'17, and women's 2'33. Twenty-nine English subjects performed the recognition task.¹ Thirteen were men and sixteen were women. Error rates were comparable, with men's rates reaching 30%, and women's 26%, with an overall 28% average error rate for the English subject sample.

Twenty-five French subjects took part in the immediate free prose recall task, including eleven men and fourteen women. Men's average narrative length approximated 3'22, and women's 3'08. Thirty-three subjects performed the recognition task. Men averaged 27% of errors, and women 32%, averaging 30% errors for the French subject sample. Both the gender

¹ Unfortunately, the prose data provided by seven English and by eight French subjects were lost, hence the discrepancy in subject numbers for the two tests.

and the language groups are thus highly comparable in terms of quantitative and qualitative performance.

Most subjects were aged between 20-35. Most were actively involved in higher education, either reading for a degree or conducting research. A few of them were employed in trade or administration. About half of the subject pool had already taken part in linguistic and cognitive tests of a different nature, and all were comfortable and equally able to perform the required tasks.

8.1.2. ETHICS

Ethical procedures were followed, similarly to the categorisation and the drawing tests, using the same consent forms (see Appendix A). Consent forms were completed prior to taking part in the tests. No subject objected to the procedure and to the further use of their data for analytical and research dissemination purposes.

8.1.3. STIMULI

The memory tests attempted to contextualise motion scenes in real-life settings, using a 4½ minute extract from Charlie Chaplin's *City Lights*. This seemed important in order to minimise strategic performances resulting from isolated motion encoding in short, decontextualised video clips. The stimulus thus reached a compromise between Slobin's Frog story and dynamically represented human motion. As such, the experiment may be considered as adding a qualitative element via the use of motion in context.

The film extract was chosen from one of the less famous Charlie Chaplin films, *City Lights*. Subjects were asked whether they were familiar with the film prior to the task. Only one subject had seen the film recently, yet her performance did not differ from that of the average sample. Charlie Chaplin may be considered an Anglo-American cultural icon, yet it is equally popular with the French culture, with film series being shown yearly on television. Both samples of subjects were thus equally acquainted with the character and, therefore, minimal cultural interference may be expected. Finally, a Charlie Chaplin film was chosen because of its silent format requiring visual processing only (i.e. non-linguistic) for understanding the story. Nonetheless, the extract comprised six language boards. Yet, their inclusion was incidental to the overall understanding of the story. These boards conveyed information relating to the time of the day, and to fragments of conversations between the characters which expressed emotional states, e.g.

- (1) Night.

- (2) Tomorrow, the birds will sing.
- (3) I'm cured. You're my friend for life.

Crucially, the chosen film extract comprised numerous motion events with various types of MANNER and PATH. The scene essentially showed a suicide attempt taking place on a river bank, with two main characters, Charlie Chaplin and a drunken millionaire. The scene further presented a series of connected motion events with only two types of GROUNDS – dry land and water – and two main FIGURES, but with a multitude of MANNERS of motion, e.g. WALKING, STROLLING, STAGGERING, SWAYING, HOPPING, RUNNING, SWIMMING, CROUCHING, KICKING, and various PATH types – some TELIC, and some LOCATIVE. In short, the scene provided a convenient type of stimulus for subjects to focus their attention on MANNERS and PATHS of motion, rather than on other possible life story dimensions. Indeed, the gist of the story is conveyed by the meanings and entailments of the various motions being performed by the characters.

For analytical purposes, the film was scripted following an event-based format with an overall 23 sequential scenes, as follows (see Appendix H for full event details):

- A. The millionaire's entrance
- B. Unpacking the suitcase
- C. Charlie Chaplin's entrance
- D. The rope & rock incident
- E. Charlie intervenes
- F. Charlie's wisdom
- G. The suicide attempt
- H. Charlie's first swimming session
- I. The millionaire's indecision
- J. Charlie's drowning
- K. The millionaire's first swimming session
- L. The debacle
- M. Dry land
- N. Gratitude
- O. Charlie's second swimming session
- P. The millionaire's second swimming session
- Q. The debacle II
- R. Friendship

- S. Smartening up
- T. The policeman’s entrance
- U. The exit
- V. The flower
- W. The end

Each scene represents a main sub-event and was further scripted for a more precise description of the minutiae details and their conceptual nature (see Appendix H for full script), e.g.

A. The millionaire’s entrance

- | | | |
|------|---------------------------------------|----------------------|
| i. | A man comes down a staircase | = PATH of motion |
| ii. | He carries a suitcase and a cane | = PROPS |
| iii. | He is wearing evening dress and a hat | = FIGURE description |
| iv. | He leans against the wall for support | = MANNER of motion |
| v. | His walk is wobbly | = MANNER of motion |

Following this scripting analysis of the stimulus, at least 150 pieces of objective information could be conveyed in recalling the story. Among this count, six sub-events were talking events, ten were vision events, fifteen were FIGURE descriptions, and 122 were motion events.

8.1.4. PROCEDURE & INSTRUCTIONS

The procedure consisted in two sessions, with an average of twenty-four hours between the two sessions. In the first session, the subject watched the film extract once, in silence, without taking any notes. Following visualisation, the subject recounted the extract verbally – which was taped using a mini-disc recorder. Subjects could take as much time as necessary. Following the free prose recall, subjects watched the film a second time. During the second visualisation, they provided a ‘live commentary’ of the film, that is, they described the film whilst it was played on the screen. This ended the first experimental session. Subjects were aware of the full procedure prior to starting the first visualisation. The purpose of the second visualisation was to minimise pressure to recall all the details from the first viewing. Such pressure exerted over 4 ½ minutes would likely result in good recall of the first minute and a half of the film, and poor recall of the rest, due to memory limitations. As such, the results would not represent naturalistic tendencies in memorisation. The second viewing also allowed subjects to monitor their own recall, and to conceptualise the task as a game in which they had some control, rather than a test in which the experimenter had full control. This was further hoped to give subjects greater confidence in performing the second session of the test. The aim was thus to minimise subject conditioning,

and to maximise their comfort with the task. In addition, given the length and multitude of events and sub-events in the film, it seemed unrealistic to implement late recall tasks the following day on the basis of a single viewing. Error rates might have then proved disproportionate. Indeed, for the experiment to be insightful, it requires both erroneous *and* accurate recall. This session never exceeded 20 minutes overall.

Experimental instructions were given in the subject's native language, as follows:

I'm going to show you a short extract from Charlie Chaplin *City Lights*, on the TV. It lasts about 4-5 minutes. You'll see it once, and straight after, I'll ask you to tell me what you can remember of it. And you can take as much time as you want. Of course, you're going to forget the odd thing, but it's ok, because, after you've told me the film, we're going to watch it a second time. And when we watch it the second time, I'll ask you to describe the whole thing at the same time as you watch it, like a 'live commentary.' And then, we'll be done for today, and we'll meet again tomorrow, and we'll talk about the film again.²

Instructions were followed with checking of understanding, and the odd question to clarify the procedure. Subjects understood the task with ease, and were typically relaxed, especially given the comical nature of the stimulus.

At the end of the first session, subjects were asked not to make any effort at recollecting the film in the following twenty-four hours. For instance, they were asked not to describe the session to friends or relatives, or in personal diaries. They were literally instructed 'to return to their normal lives as if nothing had happened.'

The second session took place the following day. The subject was asked to re-tell the story first, following which a questionnaire interview was implemented. The late free prose exercise was used as a 'cognitive warm-up' to initiate the session. Subjects' performance was invariably longer in time length than their immediate performance, suggesting increased processing as well as greater comfort with the experimental setting.³ The questionnaire represents the late recognition task. It comprised thirty-one questions on varying aspects of the film extract, including GROUND, FIGURE, PATH, MANNER, OBJECT, and TIME descriptions. Subjects were explicitly told not to provide an answer if they could not remember given details, so as not to obtain chance answers. This session never exceeded 15 minutes. It ended with debriefing questions on memorisation strategies.

² Instructions in French were as follows: 'Je vais vous montrer un film à la télé. C'est un film extrait de Charlie Chaplin – *Les Lumières de la Ville*. Ça dure entre 4 et 5 minutes. Alors, on le regarde une fois ensemble, et tout de suite après, je vous demande de me raconter tout ce dont vous vous souvenez du film. Et vous pouvez prendre autant de temps que vous voulez. Bien sûr, vous allez sûrement oublier des détails; mais c'est pas grave, parce qu'on va regarder le film une deuxième fois. Et pendant qu'on le regarde la deuxième fois, je vous demanderai de me faire en commentaire en direct du film. Et après ça, ce sera fini pour aujourd'hui; et on se reverra donc demain, et on reparlera du film à ce moment-là.'

³ Note that only the immediate – and not the late – free prose results will be discussed in this chapter.

8.1.5. SUMMARY

The nature of the present tasks differs from the highly controlled experiments reported in Chapters 6 and 7, by using a different type of stimulus where motion is contextualised in a more realistic framework of life events. This choice was deemed relevant as (a) it would minimise strategic approaches as typically observed in problem-solving types of tests, and (b) it would also be more representative of naturalistic event conceptualisation.

The cognitive function under examination is memory – both short- and long-term. This function has been investigated in other research (e.g. Papafragou et al. 2002, Gennari et al. 2002 – see Chapter 4), yet it has not been found to be subject to likely relativistic effects. However, these research examples were highly controlled in terms of set-up, and they decontextualised motion events from real-life frameworks.

In addition, the present stimulus offers a great number of PATH and MANNER types, with the latter presenting differing levels of fine-graining. The findings reported below offer in-depth analyses of the accuracy of recall of all the schemas present in the stimulus, with special attention to PATH and MANNER types.

8.2. IMMEDIATE FREE PROSE RECALL

8.2.1. ANALYTICAL PROCEDURE

In the free prose recall, narratives were analysed as per information statement. A statement constitutes one type of conceptual information about the scene on e.g. PATH, MANNER, FIGURE, or other such details – as described above in A.(i)-(v), e.g.

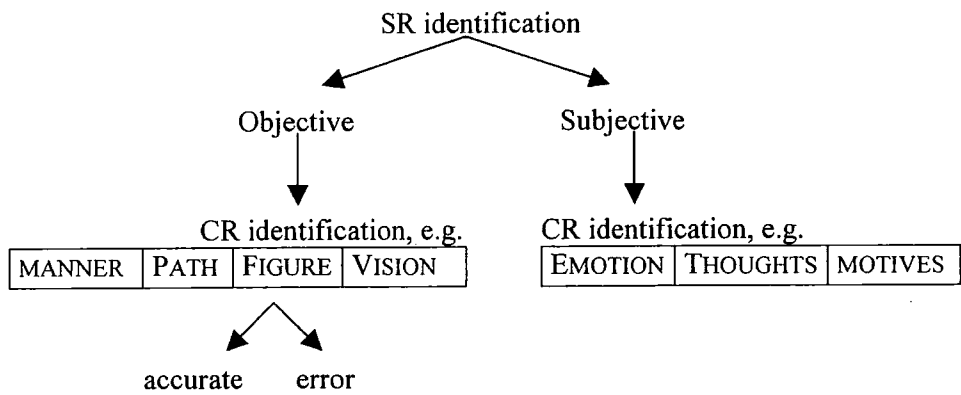
- (4) a man comes down some stairs
- (5) he's sort of drunkenly stumbling down the steps
- (6) in his evening dress pin suit tuxedo

In the above English data sequence, the narrative sentence was split as shown in (4)-(6), as (4) represents PATH only information, (5) represents MANNER information (as well as reiterating the PATH segment in (4)), and (6) FIGURE information.

Each narrative was categorised per statement type in this fashion, that is, it analysed semantic representations at the phrase level, and allocated each SR segment to a conceptual representation, e.g. PATH, MANNER, VISION, FIGURE. From this categorisation, each representation was analysed as either accurate or as inaccurate, relative to the stimulus. Note that unmentioned information did not count as an error. Only descriptive statements could afford objective judgement with respects to their accuracy, and hence any subjective type of statement,

e.g. emotional states, motivations, were not included in the error analysis. The analysis process could be exemplified as shown in Figure 8.1.

Figure 8.1. Free prose recall analytical process.



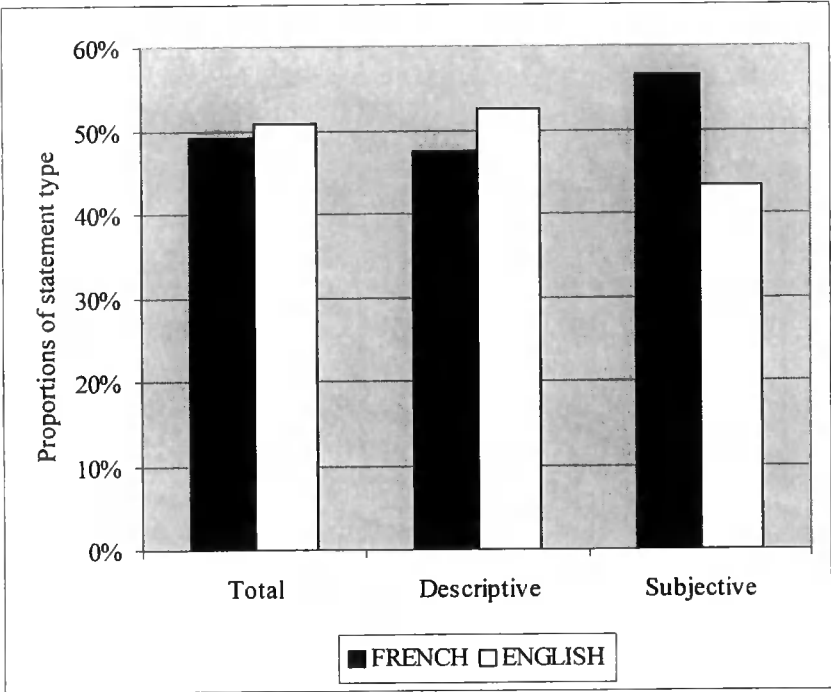
The analysis also took into account the frequency of CR type mapped onto SRs – both objective and subjective – as well as the quality of that encoding, e.g. MANNER fine-graining. The analysis was thus both quantitative and qualitative. Analyses of the prose recalls were expected to indicate whether, relative to the total number of statement type, error rates for accurate recall of varying motion schemas would differ across language groups. Hypotheses examining PATH and MANNER were of two kinds. Given the low salience of MANNER in French semantics, it was therefore expected that the French speakers might make more errors in recalling MANNERS, especially fine-grained MANNERS of displacement. Likewise, given the lower salience of TELICITY in English encodings, more errors on TELIC PATHS could be expected in the English sample. However, based on Slobin’s research, we could anticipate that the English speakers would use MANNER SRs to a great extent. As a result, one might equally expect that a higher frequency of MANNER mappings would increase error probabilities. Hence, one may also expect greater error proportions on MANNER from the English speakers. Finally, given Slobin’s findings on the overall Romance style of expressing static scene details more consistently in discourse, one might also expect a greater frequency of static SRs in the French narratives, e.g. FIGURE DESCRIPTIONS, AGENT STATES, GROUNDS. It is therefore possible to find different error rates on accurate recall of FIGURES and GROUNDS across the two language groups.

8.2.2. FINDINGS

8.2.2.1. Narrative Analysis

As mentioned in the section above, narratives were analysed on a statement-type basis. The total number of French statements amounted to 1037 (mean number of statement per subject

=41.48),⁴ including 833 objective statements (M=33.32) and 204 subjective ones (M=8.16); and the total number of English statements amounted to 947 (M=43.05), including 809 objective statements (M=36.77) and 138 subjective ones (M=6.27) (see Graph 8.1.).



Graph 8.1. Distribution of descriptive & subjective statements across language groups.⁵

Graph 8.1. indicates that, relative to group size, the total number of statements is equivalently shared between the two groups, making their performance highly comparable on quantitative grounds. The distribution of statement types differs slightly across the groups though, with the English speakers offering a slightly greater proportion of objective statements, and the French speakers presenting a substantially greater proportion of subjectivity. Indeed, out of all descriptive statements, over 52% were expressed by English subjects and 47.5% by French speakers – an insignificant difference. On the other hand, out of all 342 subjective statements, a considerable difference of 13 points exists across the two groups, suggesting different discursive tendencies, with the French speakers offering subjectivity of description more consistently than the English speakers.

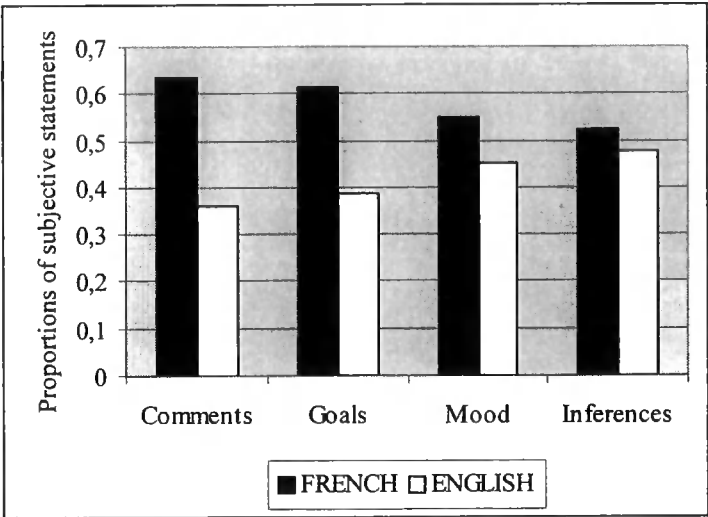
Subjective statements were found to relate to aspects such as agent goals, e.g. (7), agent moods, e.g. (8), subjective comments on the film, e.g. (9), and story inferences, e.g. (10).

- (7) but then the guy decides to drown himself again
- (8) and the guy kind of gets a bit miffed

⁴ Means per subject or per item will be referred by the capital letter M, henceforth.
⁵ Note that percentages are based on means, since subject sample sizes differ across groups.

- (9) and then we have a few more comedy moments where you think ‘oh! oh! one of them is going in! oh, no he’s not! He’s just been saved’
- (10) they don’t seem to be able to swim

The distribution of these subjective statements across the language groups is shown in Graph 8.2.



Graph 8.2. Distribution of subjective statements across language groups.

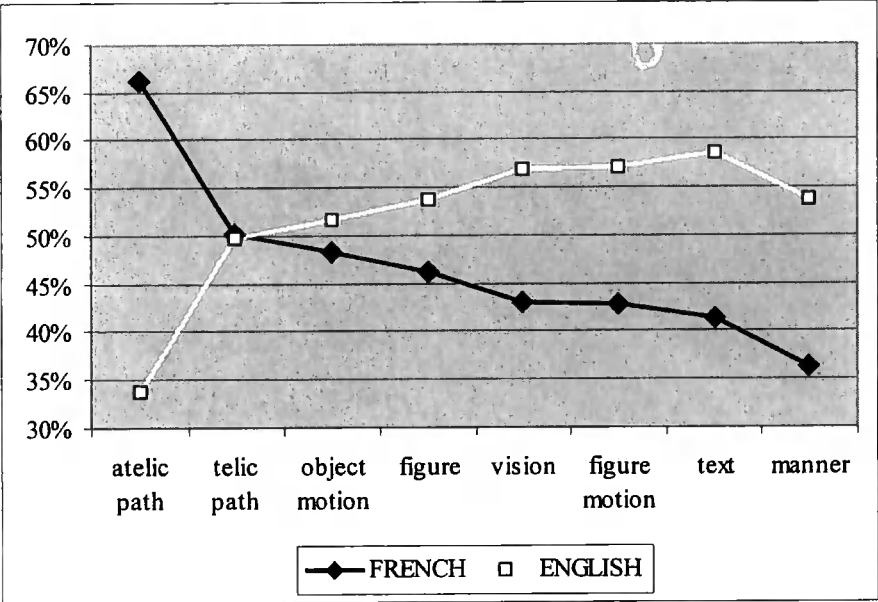
Graph 8.2. indicates that over 60% of subjective scene comments and agent goal statements were made by the French-speaking group. The distribution across agent mood and story inference statements is more equally allocated. The 22 point difference regarding goals is particularly interesting when considering the conceptual relatedness between agent goals – or intentions – and TELICITY in motion events. As suggested by Slobin’s research and by the drawing experiments in Chapter 7, French appears more prone than English to render goals and intents overt in expression – here, in language use.

Objective statements, on the other hand, ranged across a greater variety of CRs, including PROPS, e.g. (11), GROUNDS, e.g. (12), FIGURES, e.g. (13), VISION, e.g. (14), TEXT, e.g. (15), PATHS, e.g. (16), MANNERS, e.g. (17), and MOTIONS, e.g. (18).

- (11) [the suitcase] has a rock and a rope in
- (12) there’s water on the left of the scene
- (13) Charlie Chaplin, black hat, black moustache, black jacket, black trousers, white shirt
- (14) he looked up at what was going on
- (15) the silent movie subtitles come up saying ‘tomorrow the birds will sing’
- (16) right then a policeman comes by
- (17) the drunk is always tittering on the edge

(18) and you see the two of them climbing back out of the water

Overall, both groups' narratives mentioned each event sequence as listed in (A)-(W) equally. However, they differed in their mention of sub-events within those sequences, meaning that language groups displayed distinct preferences for particular CRs over others (see Graph 8.3).



Graph 8.3. Distribution of descriptive statement types across language groups.

Graph 8.3. confirms the discursive predictions made by Slobin, in that of all lexicalised motion events mentioning either PATH and MANNER, i.e. object and figure motion, or MANNER only, the English group produced over 50% of those statements. On the other hand, TELIC PATH-only motion was equally lexicalised by both groups over the total sample of such statements, though atelic PATH-only information receives significantly more systematic encoding in French narratives than in English narratives.

The present data contains over 1600 objective statements overall, and the relative distribution of the above schemas in lexicalisation can be further analysed based on their nature relative to the film stimulus, as well as the variable mention of sub-event information. Looking at those sub-events, eight were mentioned by over 70% of subjects in both groups, as follows:

- | | |
|---|-------------------------------|
| A1. a man comes down some steps | = FIGURE MOTION (ATELIC PATH) |
| B9. the man puts a noose around his neck | = OBJECT MOTION |
| C2. Charlie comes down some steps | = FIGURE MOTION (ATELIC PATH) |
| C9. Charlie sits down on a bench | = FIGURE MOTION |
| E1. Charlie stops the man from throwing himself in the river | = FIGURE MOTION (RESULT) |
| G4. the man accidentally puts the noose around both their necks | = OBJECT MOTION |

- H2.

Charlie goes flying into the water

= FIGURE MOTION (TELIC PATH)
- T1.

a policeman arrives on the scene

= FIGURE MOTION (ATELIC PATH)
- The English sample mentioned an extra three sub-events over 70% of the time, as follows:
- D6.

the man ties the rock to the rope

= OBJECT MOTION
- D7.

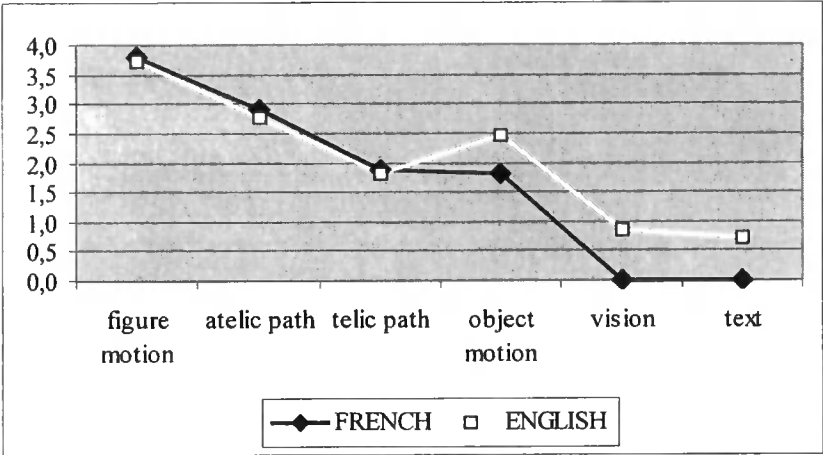
Charlie notices the man and stares at him raising his eyebrows

= VISION
- R2.

the man says he is cured and they are friends for life

= VERBATIM TEXT

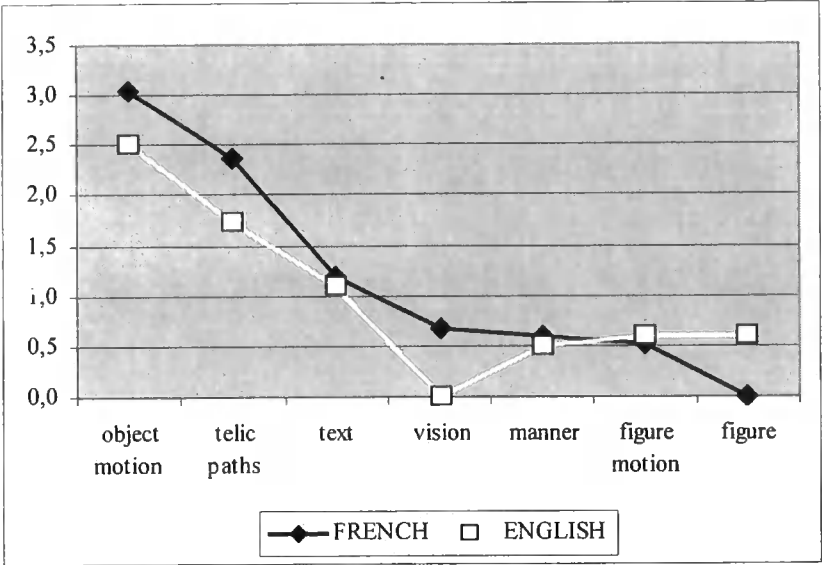
In other words, over 70% of subjects in both language groups found directed figure motion especially worthy of expression, yet the English sample found vision, textual, and another object motion equally critical to narrating the crux of the plot (see Graph 8.4.).



Graph 8.4. Mean number of descriptive statement type expressed by over 70% of subjects.

Graph 8.4. confirms that the film story centres around the motion of the characters in the film. Figure motion statements (including PATH-only descriptions) were found to be distributed equally in both samples.

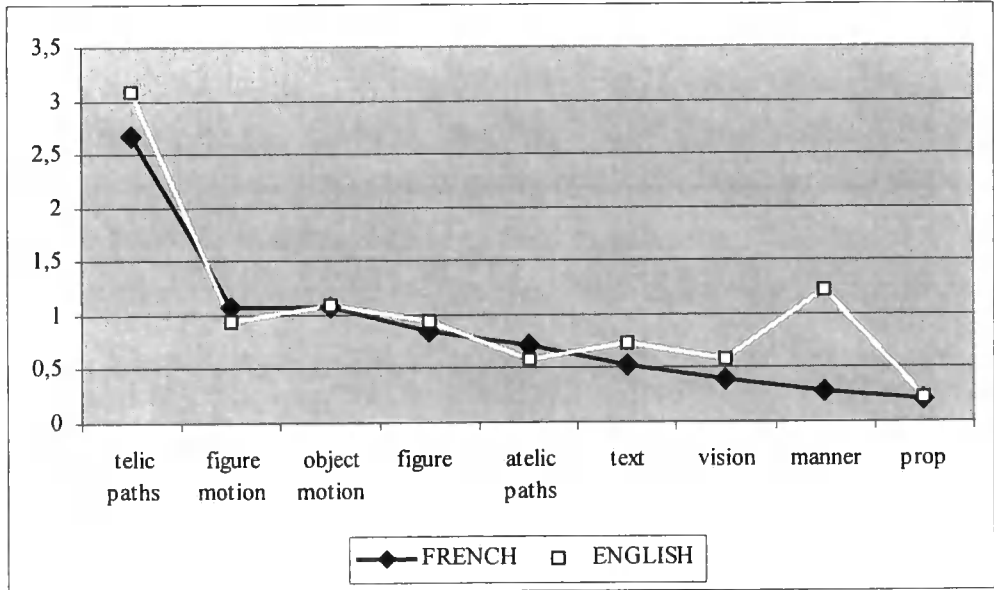
All other sub-events in the script (see Appendix H) were mentioned less than 70% by subjects in both groups. It is under this threshold that discrepancies appear between the two language groups, as information encoding then becomes a selective process. Overlaps between the two groups were still found for information encoded above chance probability, that is, between 50-69% of narratives. Information statements mentioned between that bracket of frequency included more CR types, e.g. PROPS, VISION, OBJECT MOTION, MOTION RESULTS and TELIC PATHS, and FIGURE MOTION. The distribution of mention by subjects in both groups is displayed in Graph 8.5.



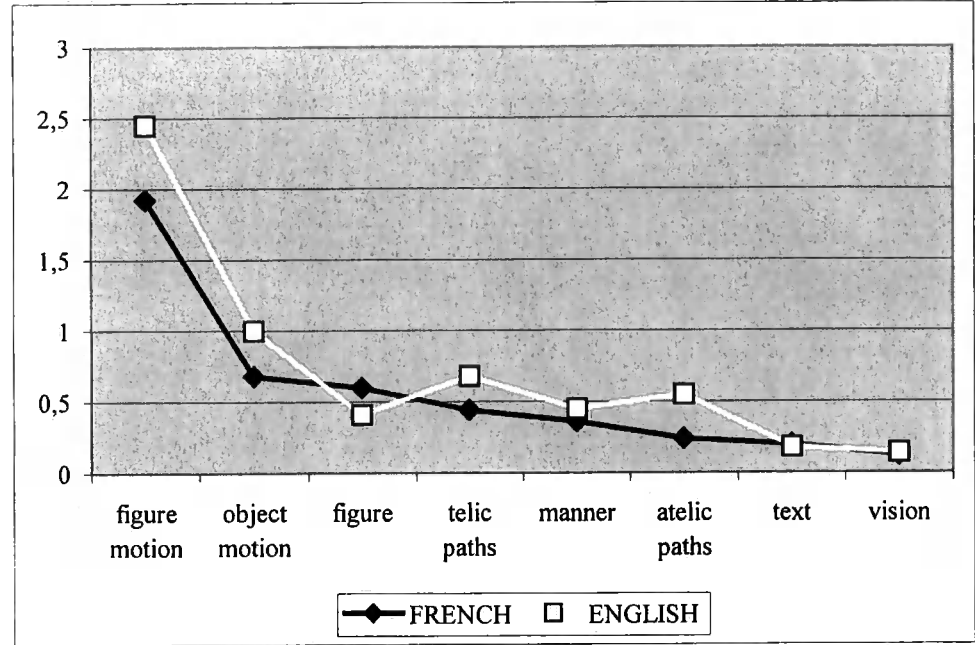
Graph 8.5. Mean number of descriptive statement type expressed by 50-69% of subjects.

Graph 8.5. confirms the greater tendency to express TELIC PATHS in French, as compared to English. It also indicates that the object motion events encoded by over 70% of English subjects are encoded by only 50-69% of the French subjects (see Graph 8.3. for comparison). This finding agrees with discursive findings reported in the literature regarding the lower consistency in encoding motion events in full in Romance languages.

Graphs 8.4. and 8.5. thus display the relative distribution of CRs deemed most salient in the stimulus to deserve mapping onto SRs in over 50% of narratives. The following two graphs display the distribution of the remainder of the statement types, as expressed in 20-49% of narratives (Graph 8.6.), and as expressed in 1-19% of narratives (Graph 8.7.).



Graph 8.6. Mean number of descriptive statement type expressed by 20-49% of subjects.



Graph 8.7. Mean number of descriptive statement type expressed by 1-19% of subjects.

Graphs 8.4. to 8.7. thus show a dimension not apparent in Graph 8.3., namely preferential patterns in discursive expression. Indeed, Graph 8.3. indicates that e.g. TELIC PATHS are equally lexicalised by both language groups, yet the above analysis indicates that such schemas are not the lexical priority in the average English construal of the film stimulus. These graphs thus essentially show discourse tendencies in both languages, in that information mentioned in over 50% of narratives may be said to indicate preferred CR mappings onto SRs, whereas the information mentioned in less than 50% of narratives is suggestive of selective CR mappings onto SRs. Considering these four graphs, we may discard Graph 8.4., as it relates to a minority of CRs giving the crux of the stimulus plot, i.e. it represents eight events only (out of over 150) – essentially the same for all viewers. However, the other three graphs are highly insightful with respects to selective encoding and preferential tendencies, on the other hand.

8.2.2.2. Error Analysis

The error analysis was based on the objective statements only. Errors were made on a few motion CRs only, namely TELIC PATHS, MANNERS, MOTION EVENTS, and FIGURES, e.g.

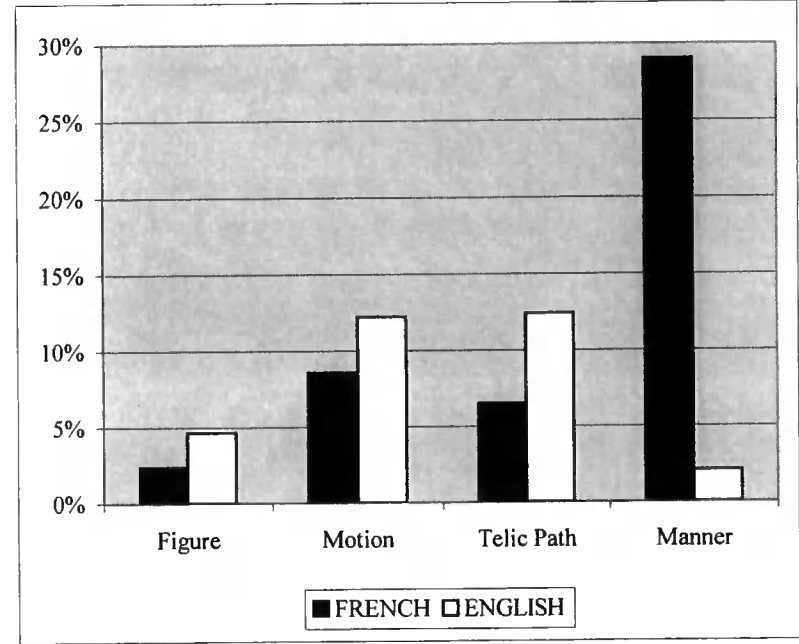
- | | |
|--|----------------------|
| (19) the policeman walks off | = MOTION EVENT error |
| (20) he's got a flower or a lollipop in his hand | = FIGURE error |
| (21) and they get out again | = TELIC PATH error |
| (22) somehow the man bumps him | = MANNER error |

The distribution of those four types of objective statements is illustrated in Table 8.1.

Table 8.1. Distribution of TELIC PATH, MANNER, MOTION EVENT, & FIGURE statements.

	French		English	
	Total N	Mean N per subject	Total N	Mean N per subject
MOTION EVENTS	291	11.64	303	13.77
TELIC PATHS	184	7.36	161	7.32
MANNER	31	1.24	48	2.18
FIGURE	42	1.68	43	1.95
TOTALS	548	21.92	555	25.23

It is possible to suggest that higher frequencies of statements may induce higher error probabilities. This is true overall, as the French group produced 8.6% of erroneous statements (i.e. $N_{\text{error}}=47$), and the English group produced 10.8% of errors (i.e. $N_{\text{error}}=60$). These preliminary figures across language groups remain comparable nonetheless. Error rates in accurate memorisation reveal different patterns across the language groups (see Graph 8.8.).



Graph 8.8. Proportions of errors in the free prose recall.

Graph 8.8. reveals higher error proportions on MOTION EVENTS in the English sample. This may not be surprising given the notably higher mean number of such statements in that group. The differences of interest remain, nonetheless, those bearing on MANNER and TELICITY information. In those cases, the analysis reveals significant differences in accuracy of recall, regardless of the actual frequencies of statement type. Graph 8.8. indeed indicates poorer recall of TELIC PATHS by the English group, as compared to a marginal 6.5% of errors on such CRs by the French group. Showing yet a starker contrast is the exceedingly accurate recall of MANNER types by the English sample – a mere 2.1% of errors – as compared to a considerable 29% of errors on such

information by the French. These initial results are strongly indicative of diverging memorisation of the same events by the English and the French. These results are in line with relativistic predictions, which would suggest that poor CR codability in language entails low attention to such CRs, and hence low cognitive salience of those CRs. In the present case, the data appears to suggest that MANNER is less cognitively salient to French native speakers – as it also is semantically in the French language; and that TELICITY is likewise less cognitively salient to English native speakers. These latter findings regarding TELICITY are also congruent with the findings reported in the preceding chapter on dimensional salience through drawing.

8.2.3. SUMMARY

The experiment reported above suggests significant differences in the accurate recall of TELIC PATHS and MANNERS across the two language groups, with French speakers displaying better recall of PATH details, but poorer recall of MANNER information. These differences agree with the language-based predictions entailing that MANNER is more closely attended to by native English speakers – given the high codability of its dimensions in English – whereas PATH seems more readily foregrounded in French cognition as a result of their linguistic foregrounding in French lexicalisation patterns for motion encoding. Those differences thus appear to be in line with the conceptual dimensions highlighted in French and English prototypical linguistic encodings of motion, suggesting the possibility of relativistic effects of habitual language patterns on memory, in this instance.

8.3. LATE RECOGNITION RECALL RESULTS

As detailed in section 8.1., all subjects ($N_E=29$, $N_F=33$) took part in a late recall session some 24 hours after initial stimulus viewing. The recognition recall was implemented using a questionnaire consisting of 31 questions (see Appendix I). The aim of the recognition questionnaire was to assess accuracy of recall on specific dimensions, as opposed to relying on what subjects may find relevant to narrate in free prose. With a targeted questionnaire, elements either forgotten or erroneously recalled are clearly identified, whereas in spontaneous narratives, the unsaid does not clearly equate with the forgotten, and the pressure of oral expression may induce unintended inaccuracies.

Questions included reference to various CRs in the stimulus, including one question on GROUNDS, 2 questions on TEMPORALITY, 6 questions on FIGURES, 10 questions on MANNERS OF MOTION, 4 questions on PATHS, 4 questions on MOTION EVENTS, 2 questions on OBJECTS and PROPS, and 2 questions on CAUSALITY, e.g.

- Q1. Could you describe what is on the scene grounds at the very start? There's a river, for instance, where is it?

= GROUND question
- Q4. Who arrives first on the scene?

= TIME question
- Q8. Do both men have a hat?

= FIGURE question
- Q5. Does Charlie walk down the stairs one step at a time?

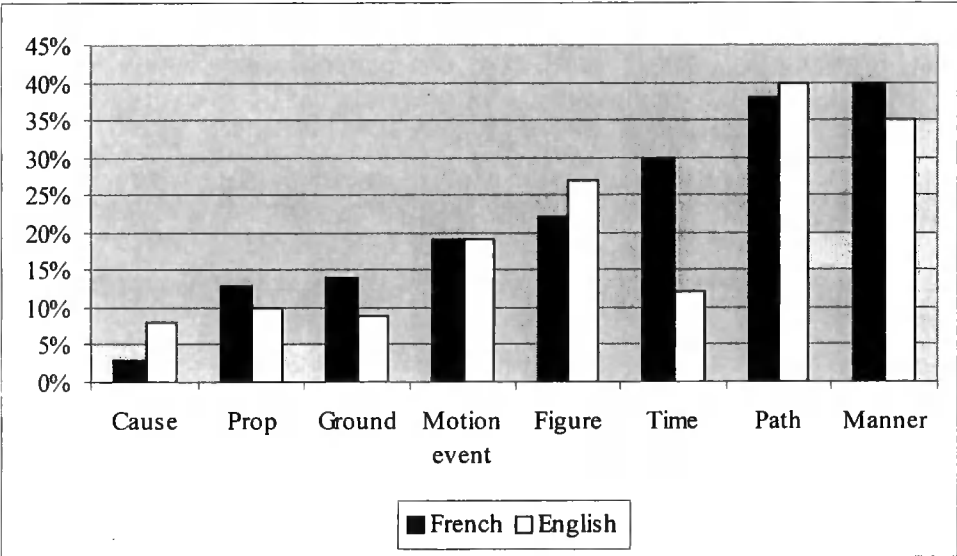
= MANNER question
- Q23. A policeman arrives. Where does he come from? And where is he going?

= PATH question
- Q25. How do the two characters exit the scene?

= MOT EVENT question
- Q26. Charlie forgets one thing behind. What is it? And where is it?

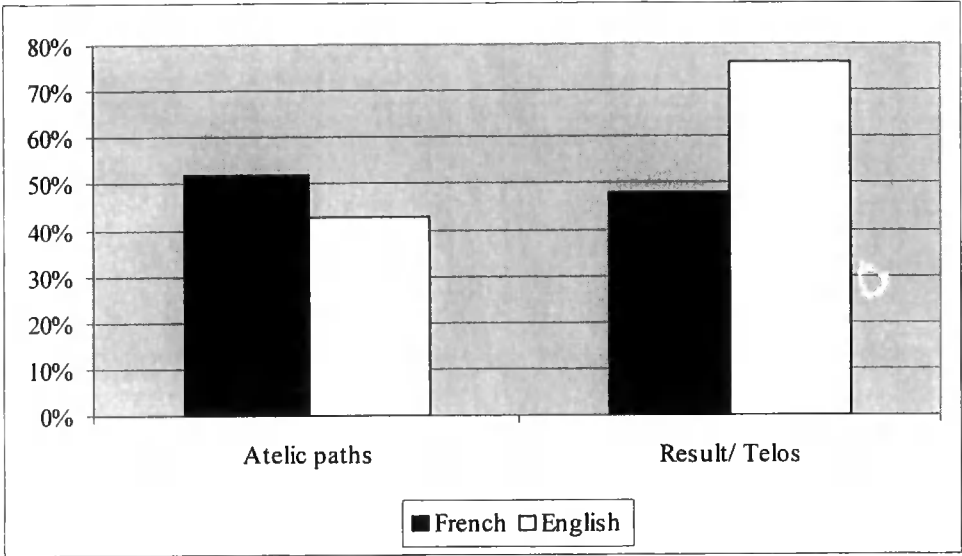
= PROP question
- Q13. Is it the millionaire who causes Charlie to fall in the water the first time?

= CAUSE question



Graph 8.9. Distribution of error rates in the recognition task.

Graph 8.9. illustrates the distribution of error rates across all the question types. Few differences are of interest on this graph, besides that on temporal information – which seems to have unclear relevance to the focus on motion here. Still, the graph does show small differences across the two groups on MANNER and PATH dimensions, with more MANNER errors made by the French group, and more PATH errors made by the English group. A closer examination of each type of question provides greater insights into the itemised dynamics of pertinent motion schemas. For instance, the PATH questions included both RESULTATIVE or TELIC events and ATELIC PATHS. Those questions yielded very divergent responses across the two language groups (see Graph 8.10.), so that TELIC events show better recall by the French group.



Graph 8.10. Distribution of error rates on PATH questions.

These figures require further comment. The figures for TELOS correspond to one question only (i.e. Q.19), which asked whether the character took his shoes off before rescuing Charlie Chaplin from drowning in the river. The answer was negative. Examining the motion scene more closely, the fact of taking one’s shoes off is easily inferred from a preceding set of MANNERS of motion, e.g. SITTING DOWN, CROUCHING, BENDING OVER, REACHING FOR ONE’S SHOES. In the film, the character had just taken off his jacket, and then decided to sit on a bench, where he crossed his legs, and reached for one shoe – though he never undid either shoe in the end. It may be suggested from the substantial difference in error rates, namely 43%, that English speakers inferred the RESULT of having one’s shoes off from the MANNERS of motion that preceded that RESULT. The explicitness of those MANNERS led subjects to the false deduction that the shoes had come off. One possibility for this false inference by English speakers may relate to a higher level of attention paid to MANNER. It is also worth noting that this particular error was also made in the free prose recall to a 36% extent in the English narratives, in contrast to 20% in the French narratives.

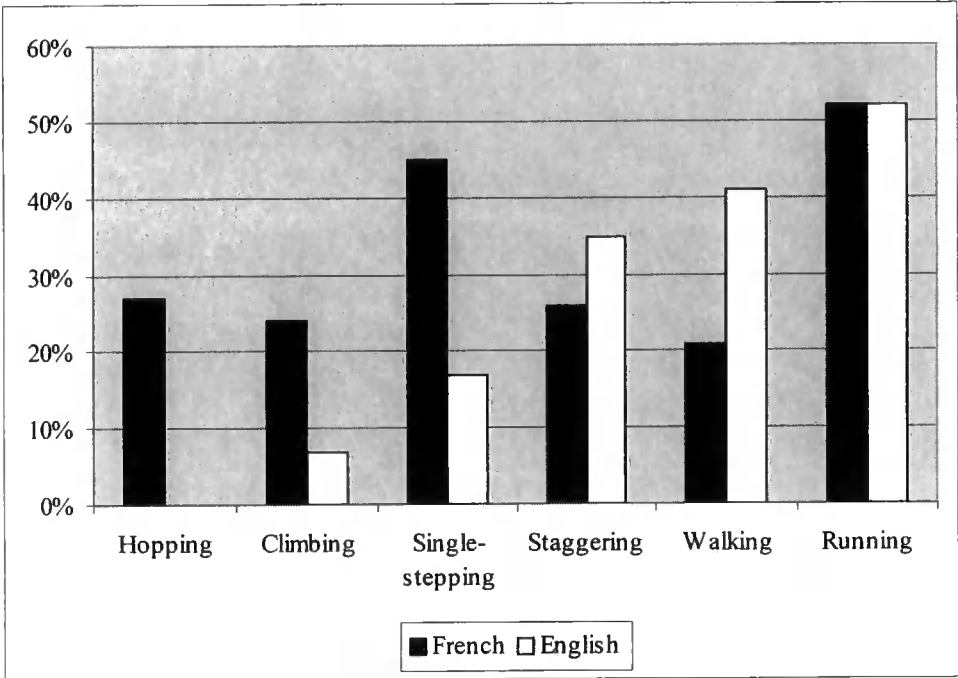
With reference to MANNER, seven questions were of analytical interest.⁶ The types of MANNER those questions asked about were as follows:

- Q5. SINGLE-STEPPING (i.e. one step at a time type of walking)
- Q9. STAGGERING, SWAYING
- Q18. STAGGERING, SWAYING

⁶ Note that two questions were deemed too hard (Q6. and Q21.) and failed to provide comparable results. As a rule, questions yielding less than 35% of correct answers in both groups were discarded. Likewise one question (Q24.) was uninteresting as it proved too easy, and was correctly answered by 100% of subjects in both groups.

- Q27. WALKING
- Q28. CLIMBING
- Q29. HOPPING
- Q31. RUNNING

The distribution of error rates for those questions is shown in Graph 8.11.



Graph 8.11. Distribution of error rates on MANNER questions.

Both groups made significantly more errors on accurate recall of DEFAULT MANNER types, such as WALKING and RUNNING events. This confirms the findings reported in the drawing experiment, according to which DEFAULT MANNER types are less closely attended to in conceptualising motion. Hence when asked whether an event was performed RUNNING or WALKING, subjects performed on either a chance basis or simply on a less confident and consistent basis. This is the case as well for STAGGERING, which is a type of WALKING. Interestingly, the English group shows significantly better recall of FORCED MANNER types, e.g. HOPPING, CLIMBING, SINGLE-STEPPING, as compared to DEFAULT MANNERS, and also as compared to the French group performance on FORCED MANNERS. These findings, though merely suggestive given the small scale of the study, are nonetheless indicative of closer attention to MANNER distinctions by English speakers, and are thus in line with relativistic hypotheses of language influences on conceptualisation.

8.4. SUMMARY

The findings reported in Chapter 8 present an overall appreciation of both narrative and cognitive styles across the French and English sample populations.

Linguistically, two different styles emerged for reporting the stimulus events in each language. It was found that the French speakers made greater use of subjective statements than the English speakers. Within those subjective statements, the French speakers made 20% more reference to GOALS than the English narratives did. With regards descriptive statements, Slobin's findings were confirmed by the present data, in that the French speakers produced more PATH statements whereas the English speakers produced more MOTION and MANNER statements. Distinctions are thus apparent on the two schemas of interest, namely TELIC PATHS and MANNERS.

Cognitively, error analyses on the immediate recall reveal poorer accuracy for TELIC PATHS by the English speakers and for MANNER types by the French speakers. These results are perfectly congruent with relativistic hypotheses. Of those differences, the one on MANNERS proved the most significant ($Ne_E=2.1\%$, $Ne_F=29\%$). Error analyses on late recognition supported these findings. TELIC events were significantly better recalled by the French speakers, whilst MANNER questions demonstrated DEFAULT types poorly recalled by both groups, and FORCED types better recalled overall, whilst FINE-GRAINED MANNER types were significantly better recalled by the English subjects, e.g. single-stepping ($Ne_E=21\%$, $Ne_F=52\%$).

To conclude, the memory findings on contextualised motion scenes from Charlie Chaplin are highly indicative of differing narrative *and* conceptual styles across the French and the English population samples. This final chapter thus offers preliminary evidence for linguistic relativity in the domain of motion.

CHAPTER 9. CONCLUSION

This doctoral research has sought to address the issue of the relation between language and thinking in human cognition, and, more specifically, it has sought to investigate by scientific means the potential for a language-specific influence on cognitive activity and putative reflexes, i.e. the linguistic relativity question. To investigate the relativity of conceptualisation across speakers of different languages, the research has adopted a combined language- and domain-centred approach (as outlined in Chapter 3) by focusing on the language patterns used to express motion events in French and English. This research has, therefore, been comparative in its treatment of empirical data of both a linguistic and a cognitive nature. To tackle these aims, the thesis has undergone a multi-disciplinary exploration of a number of related fields, and has, therefore, hoped to make several contributions to knowledge in these fields. The thesis was divided into three major sections to treat the topics at hand. In the first section – composed of the first three chapters – the thesis defined and discussed the idea of linguistic relativity. This initial section offered definitional notions, historical contextualisation of the intellectual development of relativity, and the modern framing of relativity within cognitive linguistics. Given the polemical nature of this very topic, this foundation section was critical in outlining the understanding of linguistic relativity adopted in the thesis. In the second section of the thesis, the emphasis was focused on the specific domain chosen for investigation in the present research, namely motion. This section – composed of Chapters 4 and 5 – reviewed existing theoretical and empirical research on this domain. This section identified how the motion domain is applicable to testing the relativity question, and demonstrated how linguistic representations across verb- and satellite-framed languages differ for motion expression. These two chapters were also heavily critical of the existing literature in the fields of motion linguistics and experimentation. The aim was essentially to identify methodological and analytical points of the likely problematic areas in such studies so as not to reproduce them. This middle section also proved transitory between a theoretically broad first section and an experimentally focused last section. The final section – composed of Chapters 6, 7, and 8 – further fulfilled the aims of the thesis by offering original data of a cognitive nature to tackle the relativity hypothesis. The relativity of motion conceptualisation was tested via categorisation, drawing, recall, and recognition tasks, implemented with English and French participants. The design of the experiments aimed at being both innovative and of significance to relativistic methodology. The findings reported were not transparently supportive of linguistic relativity. However, their

thorough analysis revealed a novel understanding of motion conceptualisation. The contributions made throughout the thesis are summarised in the remainder of this chapter.

9.1. LINGUISTIC RELATIVITY

This thesis has attempted to clarify the often ill-understood hypothesis of linguistic relativity. The understanding adopted follows Lucy (e.g. 1992a), whereby language patterns are hypothesised to influence cognitive functions, such as memory, categorisation, inference, and the like. These language-mediated influences are claimed to yield overall fashions of thinking about the world, that differ across language communities. This definition is thus in terms of influences and cognitive functions, rather than determining variables and neurological architecture. This definition was argued to represent Whorf's own claims concerning language, thought, worldview and linguistic relativity. Importantly, Chapter 1 teased apart the discordant notions of relativism and determinism, which have too often confused the issues and led the language-cognition debate to a dead-end. The dissociation of relativism and determinism therefore also proved an attempt at rescuing the reputation of Whorf's often-derided version of linguistic relativity.

In this spirit, the thesis has further elaborated a theoretical case for how language could influence cognition, thus presenting an overview of the initial hypotheses generated by the study of relativity. Indeed, symbolic systems of the complexity found in natural languages may be claimed to impact on cognition at (i) the semiotic level, whereby language – in a generic sense – generates species-specific cognitive patterns, (ii) the structural level, whereby the grammatical specifics of languages encourage cognitive salience to only a selection of aspects found in the 'raw' reality, and (iii) the discursive level, whereby the ensemble of language components, from lexical resources to morpho-syntactic patterns, trigger fashions of speaking and thus, offer ready-made fashions of thinking about the world at large (see Lucy 1996). In addition, the thesis allowed for a possible distinction between a further two hypotheses, whereby language effects may be either omnipresent as it were – Whorf's and Lucy's relativity – or present only when individuals are engaged in languaging acts, that is, by process of psycholinguistic interference – Slobin's relativity. Despite the variability of cognitive effects suggested, the thesis was mainly centred around structural and discursive relativity of an omnipresent nature, that is, in what has been arguably defined as Whorf's linguistic relativity. In reviewing the variability of likely hypotheses, the thesis was nonetheless aiming at (a) considering that several types of effects were possible should the data not fit so tightly within Whorfian predictions, (b) presenting the sheer breadth of investigatory scope that the idea that language has an effect on cognition is

indeed capable of generating, hence further demonstrating the relevance of the question itself, and (c) suggesting other experimental routes of relevance for the application of further research.

In addition, the thesis sought to show how the arguments that support the principle of linguistic relativity are theoretically well-founded and are, therefore, deserving of empirical investigation. These arguments included a number of properties inherent or generated by the use and knowledge of language, e.g. systematicity, complex cognitive processing, high frequency of use, early acquisition in life, social dimension, classifications, selective encodings, partial codability, multiple symbolisms, grammatical and lexical idiosyncrasies. In short, the thesis attempted to make a theoretical case for the consideration of linguistic relativity as a topic meriting contemporary study – not to mention the lack of conclusive evidence either in support of or against the idea.

The thesis further offered an in-depth historical review of the development of linguistic relativity, going back to the origins of the concept in 18th-century philosophy, then charting its development in early 20th-century anthropology, whilst looking at post-war studies in psychology, ethnography, and other related fields (see Chapter 2). This review showed that the question has provoked some intense discussion and enquiry over the centuries, thereby justifying its scientific and philosophical interest. This review also focused on Whorf's work, and his tenets received greater depth of definition and clarification. Whorf's ideas were contextualised in the light of Boas's and Sapir's insightful contributions to the study of language. Overall, this comparative overview of the epistemological progress of linguistic relativity provided intellectual contextualisation of the topic, thereby defining its aims and scope further. Finally, the review offered furthered the discussion of the argumentative strengths and likely pitfalls in the study of relativity, hence justifying a contemplation of past writings in the hope of enlightening modern endeavours in this field of research.

This historical approach was pursued to modern-day science, contextualising the relevance of the hypothesis within contemporary academic endeavours. The study of linguistic relativity was placed as centrally pertinent to cognitive science in particular. Importantly, cognitive science and linguistics situate the understanding of language as represented in the mind. In this light, the thesis offered a discussion of semantic and conceptual representations, thereby defining and also distinguishing between SRs and CRs. The discussion – though not final – argued for an understanding of CRs as 'ideas in the mind,' or mental concepts, both linguistic and non-linguistic; and for SRs as conventionalised-only language-based concepts, which are further crystallised in language forms, such as words, morpho-syntactic relations, and so on. The point of the debate was crucially to highlight the difference between the nature of

concepts and the nature of linguistic meanings. Needless to say, the distinction is indeed critical to hypothesising the influence of one type of representation on the other.

The outline of the tenets and questions addressed by modern cognitive linguistics was also pivotal in characterising the understanding of a number of fundamental points as adopted in the present research, namely schemas, semantics, grammar, and reality. In agreement with cognitive linguists, this thesis presented the interplay of those aspects as mutually constitutive. Indeed, for instance, schemas may be analysed as mapped onto semantic forms, which may themselves be grammatical in nature; and grammar itself is regarded as a meaning-making enterprise, which channels the speaker's interpretation of reality. The cognitive understanding is therefore simultaneously holistic and self-contained. And by its very theoretical stance, it was argued that cognitive linguistics indeed implies linguistic relativism. A thorough discussion of each central aspect and construal afforded by language and of the relations between those aspects and construals therefore made it possible to articulate the pertinence of cognitive linguistics to linguistic relativity, and to further illustrate the epistemological validity of the relativity question.

Taking this much as established, the thesis looked at how neo-Whorfian theory can be investigated further. In so doing, it contributed methodological insights into empirical applications, and defined distinct approaches to the actual study of relativity. Lucy's guidelines on experimental methodology were reviewed with the desire to stress both their pertinence and their necessity. Such guidelines concentrate on the form that comparative data has to take – linguistic, cognitive, and when possible cultural – as well as stressing the need for meticulous and competent analysis of all the types of data. Lucy's point has been to stress the inherent multi-disciplinarity of linguistic relativity, together with the scientific risks involved investigating in partial-only competencies. This point is indeed critical to the validity of any argumentative or empirical application of relativity. Hence it was important that the thesis should re-iterate Lucy's innovative contributions to the field.

Besides these technical aspects, the discussion further outlined the range of epistemologies possible in studying relativity. From the language-thought-reality triangle, three main epistemological points of departure were reported, corresponding to each of the triangular variables (c.f. Lucy 1997b). The thesis attempted to broaden Lucy's approaches, so as to encompass a greater number of investigatory possibilities. The three epistemologies were re-labelled (i) the 'language approach,' departing from cross-linguistic differences of expression, (ii) the 'reality approach,' departing from domain examinations and extensions into divergent language framing, and (iii) the 'cognition approach,' departing from notable behavioural and

cognitive differences across language speakers. The innovative conclusion reached suggested that the combination of epistemologies, such as language- and reality-based ones, would further ensure that empirical studies had a rigorous, multi-disciplinary base. The scope of this theoretical and methodological discussion reached beyond the relativistic applications in the remainder of the thesis. In so doing, its underlying aim was to suggest further research along a diversity of epistemological axioms. Crucially, it sought to demonstrate the methodological feasibility of relativistic research in modern cognitive science.

The thesis thus defined an understanding of linguistic relativity that is congruent with contemporary academic concerns in cognitive linguistics and cognitive science. It also synthesised a number of important points concerning the modern study of linguistic relativity, from foundational definitions, to theoretical arguments, empirical hypotheses, methodological outlines, epistemological stances, and so on – both in past and contemporary academia.

9.2. MOTION IN LANGUAGE & MIND

Building on this template, the thesis proceeded to identify the focus of the present investigation as the domain of motion in cognition and in language representations. The domain of motion was chosen on the basis of its pervasiveness in humans' daily activities and thoughts, and consequently, its need for expression in language. Furthermore, this domain is particularly productive in linguistic relativity because it requires the differential selection of domain schemas for expression in language, with far-reaching consequences at the lexical, structural, and discursive levels. A substantial number of schemas enter the make-up of motion events, yet this thesis focused especially on those of *PATH* and *MANNER* as these were found to differ the most in semantic mappings across languages – including closely-related languages. As noted time and again, and as demonstrated by existing typological frameworks and by the varied provision of naturalistic language data, *PATH* is always mapped onto linguistic representations of motion events, and centrally so in verb complexes; yet *MANNER* can either be richly lexicalised in main verbs – in satellite languages – or rather poorly encodable in optional constituents – in verb-framed languages. The relativistic hypothesis thus becomes whether verb-framed speakers conceptualise *MANNER* less saliently than satellite speakers, and possibly too, whether verb-framed speakers conceptualise motion events more in resultative terms of the directionality, and satellite speakers more in dynamic terms of the action processes.

Having thus framed the empirical question at hand, the thesis reviewed a selection of recent studies on the topic. Besides introducing the focus, this literature review sought to contribute a critical assessment of the relativistic aims, hypotheses, methods, and analyses used

by the various research teams. It thereby sought to afford a constructive template for the application of the domain of motion onto novel experimental attempts. Crucially, the review identified a lack of congruence across research findings as seemingly related to methods and analytical measures. For instance, some teams found equal salience of MANNER and PATH, others reported a 40%-60% distribution of scores in favour of PATH, or again in favour of MANNER. Some teams found no differential performance across language groups, whilst others reported divergences in memory tasks, or in pre-primed tasks. In addition, these studies demonstrated the relevance of Lucy's methodological guidelines, in that they failed either to elaborate competent language-based hypotheses and linguistic analyses, or to use competent methods of experimentation in terms of stimuli quantity and quality, elicitation instructions, for example. Such observations called forth renewed investigations into cognitive representations of motion in order to enable reliable methods of research.

From this critical template, the thesis followed the 'language epistemological approach' by thoroughly outlining the linguistics of motion at the structural, discursive and lexical levels, via existing frameworks of reference, e.g. Talmy (1985), Slobin (2004). This linguistic analysis was also reviewed critically, especially in the light of original French and English language data drawn from sentence elicitation tasks, verbal discourse tasks, and grammaticality tests. Indeed, though the frameworks of reference proved reliable in terms of preferential trends, they failed to account for a substantial number of discrepancies found in the French data in particular. The quality and quantity of such discrepancies justified an in-depth linguistic discussion of French motion lexicalisation. Besides the provision of original data, a number of contributions emerged from this linguistic exercise. For one, it was found that there is a need to distinguish motion events from motion activities, as PATH is core in the former, yet MANNER is core in the latter. The validity of the argument was further illustrated by reflective mappings in language representations, so that MANNER indeed does become the main verb in both French and English in the lexicalisation of activities. Secondly, a number of unreported patterns in verb-framed languages were presented, together with an explanatory pragmatic analysis. Finally, it was suggested that existing frameworks and typologies might have linguacentric tendencies and may, therefore, be doomed to facing contradicting data time and again. As an alternative, a conceptual framework was outlined, in which the analyst departs from the domain structure and components, i.e. CRs, prior to mapping semantic resources, i.e. SRs, into the analyses. This framework of 'PATH maps' represents the innovative design of a different model for motion linguistics to schematise the dynamics of the conceptual and linguistic encoding of motion. The model remains to be fully developed, yet it offers an alternative, and potentially valid, new

approach to linguistic framing, which has the advantage of avoiding linguacentrism whilst also incorporating several domain dimensions considered at several levels of linguistic analysis. As such, it may be seen as an epistemological contribution to motion linguistics, and potentially as an empirical and theoretical contribution also. It is therefore hoped that the conceptual point of departure exemplified in this model contributes to the further modelling of language phenomena. The thesis thus offered a substantial linguistic contribution, so as to ensure epistemological rigour of investigation. Indeed, a thorough review of the literature, of original language data, and the tentative modelling of PATH maps has generated an in-depth understanding of the linguistic dynamics for motion expression in the two languages at hand. Importantly, the accuracy of this understanding is not guaranteed by sole reliance on the literature. The thorough analyses offered in this thesis thus made it possible to validate the extent to which available models may be followed for relativistic predictions based on language facts. In the present case, both Talmy's and Slobin's frameworks were challenged with regards to the intricate complexities found in the French data. However, it was also established that though partial in their accounts of motion linguistics, the available models are sufficiently reliable to indicate preferential patterns of expression in both languages. This conclusion made it possible to frame the research question tackled in the remainder of the thesis, namely whether the PATH and MANNER schemas are differentially salient in the cognition of French and English speakers due to the differential emphasis operating in the mapping of those schemas in their respective languages.

A final contribution in this respect was, therefore, the outline of several types of predictions – two SR-based, and one CR-based. The semantically-based predictions offered the information preferentially encoded either in the verb complex or outside of it as being most cognitively salient. The duality of those predictions stems from differential interpretations of foregrounding and backgrounding in language. The conceptually-based prediction, on the other hand, suggested that the core schematicity of PATH should override the interference of semantic salience in conceptualisation.

To test these predictions of cognitive salience, the thesis contributed original experiments and data on motion categorisation, conceptualisation, and memorisation. Data collected early on during the doctoral project sought language effects on categorisation performance across French and English native speakers. The responses obtained were near-identical for the two language groups, thus these experiments were inconclusive in relation to relativistic hypotheses. However, the data proved useful in confirming the core schematicity of PATH in motion conceptualisation which was found to be equally salient across both groups. Upon further

examination, the data was found inconclusive due to stimuli design flaws. Indeed, the categorisation triads only offered contrasts between absolute types of MANNER such as WALK and RUN, rather than fine-grained types such as STROLL and STRIDE – where the critical lexical difference lies between the two languages. Nonetheless, the categorisation tests do offer important contributions, such as contributions to the methodological design of filmed stimuli, which allows the portrayal of motion events more realistically than static pictures, as used in other research,¹ and the reliability of the data obtained, given the large numbers of subjects being tested.

In addition, a deeper analysis was implemented, seeking potential ‘universals’ in the conceptualisation of motion. This analysis no longer sought language effects, but instead constituted a domain-only exploration. It positively identified a number of basic schemas conditioning the conceptualisation of motion in the mind – regardless of the cogniser’s native language. The schemas reported include PATH TELICITY, MOTION ACTUALITY, and MANNER FORCE DYNAMICS. Indeed, PATH salience appeared to increase significantly in telic motion events – in particular caused events – which were performed using a default MANNER of displacement. The validity of those analytical findings on the categorisation data was further tested via a drawing task, implemented with both French and English subjects. The drawing data was strongly supportive of the schema-based predictions. As such, the thesis contributed novel insights for further research into motion conceptualisation and suggested the refining of future methodological endeavours in motion-related research, especially of a relativistic nature.

Based on this improved schema-based understanding, the thesis restored the focus on relativistic testing in Chapter 8. This chapter tested memory, and used contextualised motion scenes from a Charlie Chaplin film extract. A thorough analysis of narratives, statement types, and error rates demonstrated important differences in memorisation performance across the French and English language groups. Importantly, the French sample showed poorer recall of fine-grained MANNERS, and the English group showed poorer recall of TELIC events. Such cross-linguistic discrepancies in cognitive performance are perfectly in line with the SRs receiving greater emphasis and better codability in the two languages. Hence the main contribution from the memory experiments was to offer evidence in support of the linguistic relativity hypothesis. These experiments prove that the domain of motion is a productive one in investigating the relativity question, and the findings they report open up new possibilities for further neo-Whorfian research along similar lines.

¹ Note that these experiments may be further appreciated as original, given their design and administration in 2001 and 2002, that is, prior to the publication of similar research (e.g. Papafragou et al. 2002, Gennari et al. 2002).

Overall, this doctoral thesis has provided a number of original insights into and valuable contributions to current research and future investigatory efforts in:

- (i) suggesting an understanding of linguistic relativity as theoretically valid;
- (ii) discussing linguistic relativity in relation to modern cognitive science;
- (iii) identifying pertinent epistemological and methodological approaches to studying relativity;
- (iv) synthesising definitional, theoretical, epistemological, and methodological tenets in linguistic relativity in the light of past and contemporary intellectual trends;
- (v) reviewing up-to-date relativistic research on the domain of motion;
- (vi) documenting typological and discursive patterns for motion expression in English and French with naturalistic data;
- (vii) suggesting the need to re-assess existing typological frameworks;
- (viii) offering an alternative model for motion expression departing from the conceptual reality of the domain;
- (ix) devising experimental set-ups for testing categorisation, schematic salience, and memory;
- (x) identifying some universal dynamics of dimensional conceptualisation of motion in cognition;
- (xi) reporting preliminary evidence in support of linguistic relativity in the domain of motion, and across two closely-related language groups.

In so doing, the present thesis has demonstrated the multi-disciplinary nature of the topic of relativity, drawing from linguistics, philosophy, and psychology – both theoretically and empirically. In addition, it has suggested a number of directions for further research into the linguistics of motion, the conceptual understanding of that domain in cognition, and its application in relativistic investigations.

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Note: The appendices mainly contain forms and event scripts. No data is included in the following pages. However, all pieces of data are available from the candidate, should the reader wish to consult them.

APPENDIX A – PARTICIPATION CONSENT FORM

STÉPHANIE POURCEL
SCHOOL OF LINGUISTICS & LANGUAGE
UNIVERSITY OF DURHAM
Elvet Riverside
Durham DH1 3JT
United Kingdom

CONSENT TO PARTICIPATE IN RESEARCH

Task-Based Psycholinguistics Doctoral Project
(supervised by Dr. S.J. Hannahs)

I hereby agree to take part in a cognitive test conducted by Stéphanie Pourcel as part of her doctoral studies at the University of Durham (UK). I have been selected as a test-subject in this project because I volunteered to participate.

I acknowledge that she has explained

- what is involved in the test,
- the purpose of the work in this area,
- her commitment to preserving the anonymity of test-subjects, and
- her commitment to using the information supplied by the test-subjects with confidentiality and impartiality.

I am aware that I may withdraw my participation in the present test at any time, and that I am under no obligation to complete the required task.

I have had the opportunity to ask questions about this test.

Signed Date

STÉPHANIE POURCEL
SCHOOL OF LINGUISTICS & LANGUAGE
UNIVERSITY OF DURHAM
Elvet Riverside
Durham DH1 3JT
United Kingdom

ACCORD DE PARTICIPATION

Projet de Doctorat en Psycholinguistique
(supervisé par Dr. S.J. Hannahs)

Je donne mon accord afin de participer au test cognitif organisé par Stéphanie Pourcel pour ses études de doctorat à l'université de Durham (UK). J'ai été sélectionné(e) en tant que participant(e) car je me suis porté(e) volontaire.

Je reconnais que Mlle Pourcel a expliqué

- ce que le test comporte,
- l'objet de ses recherches,
- son engagement à préserver l'anonymat des participants, et
- son engagement à utiliser les informations données par les participants en toute confidentialité et impartialité.

Je prends acte qu'il m'est possible de cesser ma participation à ce test à tout moment, et que je ne suis tenu(e) à aucune obligation d'achever ce test.

Le test m'a été présenté avec l'opportunité de poser des questions sur son déroulement.

Signature..... Date

APPENDIX B – PILOT CATEGORISATION STIMULI SCRIPT

LINGUISTIC REPRESENTATIONS OF MOTION EVENTS TO BE VISUALISED:

- | | | |
|-----|--|---|
| (0) | (a) lire le journal
(b) lire un livre
(c) écrire un message | (a) reading the paper
(b) reading a book
(c) writing a note |
| (Ø) | (a) cravate défaite
(b) mains liées par une corde
(c) lacets défaits | (a) undone tie
(b) hands tied by a rope
(c) undone shoe laces |
| (1) | (a) renverser la chaise violemment
(b) fermer la fenêtre en la couissant
(c) fermer la porte d'un coup sec | (a) knocking the chair over
(b) sliding the window shut
(c) knocking the door shut |
| (2) | (a) descendre les escaliers sur la pointe des pieds
(b) monter les escaliers sur la pointe des pieds
(c) monter les escaliers | (a) tiptoeing down the stairs
(b) tiptoeing up the stairs
(c) climbing up the stairs |
| (3) | (a) allumer la télé
(b) éteindre la gazinière
(b) allumer une cigarette | (a) turning the TV on
(b) turning the gas off
(c) lighting up a cigarette |
| (4) | (a) décrocher le téléphone
(b) ramasser une éponge
(c) décrocher le linge de l'étendage | (a) picking up the phone
(b) picking up a sponge
(c) taking the washing off the line |
| (5) | (a) éteindre sa cigarette
(b) mettre le moteur de la voiture en route
(c) éteindre la lumière | (a) putting out his cigarette
(b) switching the (car) engine on
(c) switching the light off |
| (6) | (a) descendre les escaliers en courant
(b) descendre la colline en patinette
(c) longer la piscine en courant | (a) running down the stairs
(b) scootering/ riding down the hill
(c) running along the pool |
| (7) | (a) monter la colline à vélo
(b) descendre la colline à vélo
(c) monter la colline à pied | (a) cycling up the hill
(b) cycling down the hill
(c) walking up the hill |
| (8) | (a) revenir à la maison (en marchant)
(b) revenir à la maison en courant
(c) sortir de la maison (en marchant) | (a) walking back home
(b) running back home
(c) walking out of the house |
| (9) | (a) éteindre la bougie (en soufflant dessus)
(b) éteindre la lumière (en appuyant sur l'interrupteur)
(c) refroidir sa boisson (en soufflant dessus) | (a) blowing out the candle
(b) switching the light off
(c) blowing one's drink cool |

- | | | |
|------|--|--|
| (10) | (a) il s'avance vers elle en boitant
(b) il s'avance vers elle [en marchant]
(c) il s'éloigne d'elle en boitant | (a) he's limping towards her
(b) he's walking towards her
(c) he's limping away from her |
| (11) | (a) elle envoie le ballon à son ami d'un coup de pied
(b) il ouvre la porte d'un coup de pied
(c) il ouvre la fenêtre en la poussant | (a) she kicked the ball over to her friend
(b) he kicked the door open
(c) he pushed the window open |
| (12) | (a) aller dans la piscine en plongeant
(b) aller dans la piscine par l'échelle
(c) sortir de la piscine par l'échelle | (a) diving into the pool
(b) step-climbing down into the pool
(c) step-climbing out of the pool |
| (13) | (a) il la salua en l'embrassant
(b) il la salua d'un signe de la main
(c) il l'accueillit en l'embrassant | (a) he kissed her goodbye
(b) he waved her goodbye
(c) he kissed her hello |

APPENDIX C – MAIN CATEGORISATION STIMULI SCRIPT

LINGUISTIC REPRESENTATIONS OF MOTION EVENTS TO BE VISUALISED:

(0)	(a) lire le journal (b) lire un livre (c) écrire un message	(a) reading the paper (b) reading a book (c) writing a note
(Ø)	(a) cravate défaite (b) mains liées par une corde (c) lacets défaits	(a) undone tie (b) hands tied by a rope (c) undone shoe laces
(1)	(a) fermer la porte en la couissant (b) ouvrir la porte en la tirant (c) fermer la porte en la tirant	(a) sliding the door shut (b) pulling the door open (c) pulling the door shut
(2)	(a) descendre les escaliers sur la pointe des pieds (b) monter les escaliers sur la pointe des pieds (c) monter les escaliers	(a) tiptoeing down the stairs (b) tiptoeing up the stairs (c) climbing up the stairs
(3)	(a) longer la route en marchant (b) traverser la route en marchant (c) longer la route en courant	(a) walking along the road (b) walking across the road (c) running along the road
(4)	(a) éteindre la bougie (en soufflant dessus) (b) éteindre la lumière (en appuyant sur l'interrupteur) (c) refroidir sa boisson (en soufflant dessus)	(a) blowing out the candle (b) switching the light out (c) blowing one's drink cool
(5)	(a) traverser la route en courant (b) traverser la route à vélo (c) longer la route à vélo	(a) running across the road (b) cycling across the road (c) cycling along the road
(6)	(a) descendre les escaliers en courant (b) descendre la colline en patinette (c) longer la piscine en courant	(a) running down the stairs (b) scootering/ riding down the hill (c) running along the pool
(7)	(a) monter la colline à vélo (b) descendre la colline à vélo (c) monter la colline à pied	(a) cycling up the hill (b) cycling down the hill (c) walking up the hill
(8)	(a) revenir à la maison (en marchant) (b) revenir à la maison en courant (c) sortir de la maison (en marchant)	(a) walking back home (b) running back home (c) walking out of the house
(9)	(a) traverser la route en marchant (b) traverser la route en courant (c) longer la route en courant	(a) walking across the road (b) running across the road (c) running along the road

- | | | |
|------|---|--|
| (10) | (a) il s'avance vers elle en boitant
(b) il s'avance vers elle [en marchant]
(c) il s'éloigne d'elle en boitant | (a) he's limping towards her
(b) he's walking towards her
(c) he's limping away from her |
| (11) | (a) fermer la porte d'un coup de pied
(b) ouvrir la porte d'un coup de pied
(c) ouvrir la porte en la poussant | (a) kicking the door shut
(b) kicking the door open
(c) pushing the door open |
| (12) | (a) entrer dans la piscine en plongeant
(b) entrer dans la piscine par l'échelle
(c) sortir de la piscine par l'échelle | (a) diving into the pool
(b) step-climbing down into the pool
(c) climbing out of the pool |
| (13) | (a) il la salua en l'embrassant
(b) il la salua d'un signe de la main
(c) il l'accueillit en l'embrassant | (a) he kissed her goodbye
(b) he waved her goodbye
(c) he kissed her hello |
| (14) | (a) mettre l'éponge dans l'évier en la jetant
(b) mettre l'éponge dans l'évier
(c) prendre l'éponge dans l'évier | (a) throwing a sponge into the sink
(b) taking a sponge into the sink
(c) taking a sponge out of the sink |
| (15) | (a) cacher un CD en le poussant sous le canapé
(b) sortir un CD de dessous le canapé
(c) cacher un CD en le poussant du pied sous le canapé | (a) to slide a CD under the sofa
(b) to slide a CD out from under the sofa
(c) to kick a CD under the sofa |

APPENDIX D – STIMULI LINGUISTIC MONITORING

• Monitoring in French

Aline 1/01/2001. French French.

- 1a Oh, il a fait tomber la chaise; c'était pas très délicat.
- 1b il ferme la porte-fenêtre doucement
- 1c il claque la porte
- 2a il descend sur la pointe des pieds les marches
- 2b il remonte sur la pointe des pieds les marches
- 2c il remonte les marches, mais normalement, pieds plats
- 3a il va allumer la télé, j'ai l'impression; oui, c'est ça, il a allumé la télé
- 3b il éteint la plaque électrique
- 3c oh il se met à fumer, lui; il allume la cigarette
- 4a il décroche le téléphone
- 4b il a ramassé quelquechose par terre
- 4c pour l'instant il fait rien; ah, il a pris du linge
- 5a il écrase sa cigarette dans le cendrier
- 5b c'est dans la voiture et il allume le contact de la voiture
- re: 5b donc là on voit la voiture encore, on voit un peu la clé, voilà là il tourne la clé de la voiture pour l'allumer
- 5c il a éteint la lumière
- 6a il descend les marches précipitamment
- 6b ah, il descend en patinette
- 6c il court bizarrement autour de la piscine
- 7a là, je sais pas si il monte ou si il descend, mais il est toujours en patinette
- 7b il est toujours en patinette et il pousse sur sa patinette
- 7c il descend tranquillement la pente
- 8a il court et il passe dans la porte qui tourne
- 8b il sort de la porte qui tourne et il court, il court, il court
- 8c il rentre précipitamment dans la porte qui tourne
- 10a ah, il boite, donc il arrive en boitant
- 10b il arrive mais plus normalement
- 10c il repart en boitant
- 11a on shoote dans le ballon
- 12a il se mouille et il va plonger dans l'eau; ça y est, il a plongé
- 12b il descend les escaliers de la piscine
- 12c il remonte de la piscine par les escaliers
- 13a c'est là qu'on se dit aurevoir en se faisant la bise
- 13b on s'en va en se faisant des petits coucous
- 13c et c'est là qu'on arrive en se faisant la bise

- **Monitoring in English**

Steve 30/03/2001. British English.

- 1a a guy knocked over a chair
- 1b he's slowly closing a patio door
- 2a somebody in bare feet coming down the stairs
- 2b somebody coming up the stairs on tiptoes
- 2c somebody walking up the stairs flat-footed
- 3a he's turning the TV on
- 3b he's turning the hob on
- 3c he's lighting a cigarette
- 4a he's picking up the phone
- 4b picking something up off the kitchen floor
- 4c he's taking a T-shirt off what you call it
- 5a stubbing out his cigarette
- 5b turning a key; starting the engine
- 5c turning off a bedside light
- 6a running down
- 6b on a scooter coming down a road; on a scooter going downhill; scootering down a hill
- 6c running alongside the pool
- 7a he's scootering down a hill
- 7b he's scootering but putting effort into it
- 7c he's walking down a hill
- 8a running again and then going through a revolving door
- 8b coming outside the door running again
- 8c I see him arriving very suddenly at the doors like he's in a rush and just going through the revolving doors again
- 10a limping along a room
- 10b drawling this time instead of limping
- 10c limping again but in the other direction
- 12a he dove in
- 12b walks backwards down the steps into the pool
- 12c he's climbing out of the pool now
- 13a a girl leaving the house and she kisses her boyfriend
- 13b this time she waves goodbye instead of kissing him
- 13c arriving back and kissing to greet him

Melinda 30/03/2001. American English.

- 1a knocked over a chair
- 1b closing sliding door all the way shut
- 1c ha slammed the door shut
- 2a walking down the stairs slowly
- 2b walking up the stairs slowly
- 2c walking up the stairs flat-footed
- 3a turned on the TV
- 3b turned on or off the stove
- 3c he lit a cigarette
- 4a answered the phone
- 4b crouched down to pick up something
- 4c lifting clothes off the hanger
- 5a put off his cigarette
- 5b sitting in his car; started the engine
- 5c turns off the light
- 6a running down stairs
- 6b riding a scooter
- 6c running alongside a pool
- 7a riding a scooter up a hill
- 7b pushing himself along
- 7c going for a walk
- 8a he's jogging and left the building
- 8b he left the building and ran
- 8c quickly ran in the building
- 10a limping towards someone
- 10b casually walking towards someone
- 10c dragging his leg
- 12a dived in the pool
- 12b entering the pool via a ladder; climbing into the pool (I would say)
- 12c climbing out of the pool
- 13a kissing or saying goodbye
- 13b waved goodbye
- 13c greeting each other

Anthony 6/03/2002. British English.

- (1) .
 - a. closing the door
 - b. opening the door
 - c. closing the door
- (2)
 - a. walking down the stairs
 - b. tiptoeing up the stairs
 - c. walking up the stairs
- (3)
 - a. walking down the street
 - b. crossing the road
 - c. jogging down the street
- (4)
 - a. blowing out a candle
 - b. turning off the light
 - c. cooling down his hot drink
- (5)
 - a. jogging
 - b. cycling across the street
 - c. cycling down the street
- (6)
 - a. running down the stairs
 - b. on a scooter going down the road
 - c. running around the pool
- (7)
 - a. cycling up the hill
 - b. freewheel coming down the hill on a bicycle
 - c. walking/ striding up the hill
- (8)
 - a. walking on the street and going into a house
 - b. jogging down the street and going into a house
 - c. coming out of a house and walking up the street
- (9)
 - a. crossing the street
 - b. jogging across the street
 - c. jogging down the street
- (10)
 - a. limping
 - b. strolling into a room
 - c. limping out of the room
- (11)
 - a. kicking the door shut
 - b. kicking the door open
 - c. pushing the door open
- (12)
 - a. diving into a pool
 - b. stepping into a pool
 - c. stepping out of the pool
- (13)
 - a. a couple talking/ kissing
 - b. a couple waving goodbye to each other
 - c. a couple greeting each other
- (14)
 - a. throwing a sponge into a sink
 - b. placing a sponge into the sink
 - c. taking a sponge out of the sink
- (15)
 - a. pushing something under a sofa to hide it
 - b. retrieving something from under the sofa
 - c. kicking a CD under a sofa

John 6/3/2002. British English.

- (1) a. sliding a door shut
b. opening a door
c. shutting a door
- (2) a. walking down some stairs
b. walking up some stairs
c. going up some stairs
- (3) a. walking down the street
b. crossing the road
c. running down the street
- (4) a. blowing out a candle
b. switching off the light
c. blowing on a drink
- (5) a. running across the road
b. cycling across the road
c. cycling along the road
- (6) a. running down some stairs
b. going down a hill on a scooter
c. running by a poolside
- (7) a. cycling up a hill
b. going down a hill on a bike
c. walking up the hill
- (8) a. going through a door on the street
b. running up to the door and going through it
c. coming out of the house and walking up the street
- (9) a. crossing the road
b. running across the road
c. running down a street
- (10) a. limping towards a girl
b. strolling up to the girl
c. dragging his foot away from the girl
- (11) a. closing the door with his foot
b. kicking the door open
c. pushing the door open
- (12) a. diving into a pool
b. getting into the pool
c. getting out of the pool
- (13) a. two people saying goodbye
b. two people waving goodbye
c. two people saying hello
- (14) a. throwing something into the sink
b. putting something in the sink
c. taking something out of the sink
- (15) a. hiding something under a sofa
b. taking something out underneath the sofa
c. kicking something under the sofa

APPENDIX E – CATEGORISATION TEST FORMS

DOCTORAL PROJECT
PILOT COGNITIVE TEST

MAY 2001

I certify that I am a native English speaker ☐

I am fluent in the English language only ☐

I have knowledge of other language(s) ☐

.....
I am fluent in other language(s) ☐

.....
Any other comment on your linguistic background that you think the researcher might like to know about
.....
.....
.....

The present cognitive test is a sorting task. You are asked to associate stimuli in terms of similarity.

You are going to see a series of video clips, on television.
Each video clip is short and mute.

The video clips are organised in lots of 3,
for example, lot 1 comprises 3 video clips a, b, and c, and
 lot 2 comprises 3 video clips a, b. and c, etc.

There are 13 lots in total.

You will be shown 1 lot of 3 video clips at a time.
Once you've watched one lot, your task is to judge/ decide which 2 clips are more similar out of the 3,
for example, you may decide to associate a & b, a & c, or b & c.

The choice is yours entirely.
There is NO right or wrong answer. And there is no trick - this test is not about intelligence or whatever.

Circle the letters corresponding to the two video clips which you have decided to pair together.

SET [0] A B C

SET [Ø] A B C

SET [1]	A	B	C
SET [2]	A	B	C
SET [3]	A	B	C
SET [4]	A	B	C
SET [5]	A	B	C
SET [6]	A	B	C
SET [7]	A	B	C
SET [8]	A	B	C
SET [9]	A	B	C
SET [10]	A	B	C
SET [11]	A	B	C
SET [12]	A	B	C
SET [13]	A	B	C

DOCTORAL PROJECT
COGNITIVE TEST

NOVEMBER/ DECEMBER 2002

I certify that I am a native English speaker ☐

I am fluent in the English language only ☐

I have knowledge of other language(s) ☐

.....

I am fluent or near-fluent in other language(s) ☐

.....

Any other comment on your linguistic background that you think the researcher might like to know about
.....
.....
.....

Age

The present cognitive test is a sorting task. You are asked to associate stimuli in terms of similarity.

You are going to see a series of video clips, on television.
Each video clip is short and mute.

The video clips are organised in sets of 3,
for example, set 1 comprises 3 video clips a, b, and c, and
 set 2 comprises 3 video clips a, b. and c, etc.

There are 15 sets in total.

You will be shown 1 set of 3 video clips at a time.

Once you've watched one set, your task is to judge/ decide which 2 clips are more similar out of the 3, for example, you may decide to associate a & b, a & c, or b & c.

The choice is yours entirely.

There is NO right or wrong answer.
And there is no trick - this test is not about intelligence or general aptitude.

Circle the letters corresponding to the two video clips which you have decided to pair together.

SET [0]	A	B	C
SET [Ø]	A	B	C
SET [1]	A	B	C
SET [2]	A	B	C
SET [3]	A	B	C
SET [4]	A	B	C
SET [5]	A	B	C
SET [6]	A	B	C
SET [7]	A	B	C
SET [8]	A	B	C
SET [9]	A	B	C
SET [10]	A	B	C
SET [11]	A	B	C
SET [12]	A	B	C
SET [13]	A	B	C
SET [14]	A	B	C
SET [15]	A	B	C

DOCTORAL PROJECT
COGNITIVE TEST

NOVEMBER/ DECEMBER 2002

I certify that I am a native English speaker ☐

I am fluent in the English language only ☐

I have knowledge of other language(s) ☐

.....

I am fluent or near-fluent in other language(s) ☐

.....

Any other comment on your linguistic background that you think the researcher might like to know about

.....

.....

.....

Age

The present cognitive test is a sorting task. You are asked to associate stimuli in terms of similarity.

You are going to see a series of video clips, on television.
Each video clip is short and mute.

The video clips are organised in sets of 3,
for example, set 1 comprises 3 video clips a, b, and c, and
 set 2 comprises 3 video clips a, b. and c, etc.

There are 15 sets in total.

You will be shown 1 set of 3 video clips at a time.

Once you've watched one set, your first task is to write down descriptions of what you saw of the TV screen, then you have to judge/ decide which 2 clips are more similar out of the 3, for example, you may decide to associate a & b, a & c, or b & c.

The choice is yours entirely.

There is NO right or wrong answer.
And there is no trick - this test is not about intelligence or general aptitude.

- (1) Describe each video clip, and
- (2) Circle the letters corresponding to the two video clips which you have decided to pair together.

SET [1]

A
B
C

SET [2]

A
B
C

SET [3]

A
B
C

SET [4]

A
B
C

SET [5]

A
B
C

SET [6]

A
B
C

SET [7]

A
B
C

SET [8]

- A
- B
- C

SET [9]

- A
- B
- C

SET [10]

- A
- B
- C

SET [11]

- A
- B
- C

SET [12]

- A
- B
- C

SET [13]

- A
- B
- C

SET [14]

- A
- B
- C

SET [15]

- A
- B
- C

**PROJET DE DOCTORAT
TEST COGNITIF**

MARS - AVRIL 2003

Je certifie que ma langue natale est le Français ☐

Le Français est la seule langue que je parle couramment ☐

Je connais d'autre(s) langue(s) ☐

.....

Je parle couramment d'autre(s) langue(s) ☐

.....

Autres commentaires concernant mon histoire linguistique (par exemple : éducation bilingue, parents sourds, etc.)

.....

.....

.....

Dans ce test cognitif, il vous est demandé de juger des films en fonction de leur degré de similarité.

Dans un instant, vous allez voir une série de clips vidéos à la télévision.
Chaque clip est court et muet.

Les clips vidéos sont organisés par groupes de 3,
par exemple, groupe 1 comprend 3 clips vidéos A, B, et C, et
 groupe 2 comprend 3 clips vidéos A, B, et C, etc.

Il y a 15 groupes au total.

Vous allez voir 1 groupe de 3 clips vidéos à la fois.

Une fois que vous avez regardé un groupe, vous devez juger/ décider quels sont les 2 clips parmi les 3 présentant le plus de similitudes; par exemple, vous pouvez décider d'associer A & B, A & C, ou B & C.

Les critères de choix vous appartiennent entièrement.

Il n'y a ni bonnes ni mauvaises réponses.

Et il n'y a pas de piège. Cet exercice ne teste en aucun cas votre intelligence ou vos aptitudes générales.

Encerchez les lettres correspondant aux deux clips vidéos que vous avez choisi d’associer.

GROUPE [0]	A	B	C
GROUPE [Ø]	A	B	C
GROUPE [1]	A	B	C
GROUPE [2]	A	B	C
GROUPE [3]	A	B	C
GROUPE [4]	A	B	C
GROUPE [5]	A	B	C
GROUPE [6]	A	B	C
GROUPE [7]	A	B	C
GROUPE [8]	A	B	C
GROUPE [9]	A	B	C
GROUPE [10]	A	B	C
GROUPE [11]	A	B	C
GROUPE [12]	A	B	C
GROUPE [13]	A	B	C
GROUPE [14]	A	B	C
GROUPE [15]	A	B	C

**PROJET DE DOCTORAT
TEST COGNITIF**

MARS - AVRIL 2003

Je certifie que ma langue natale est le Français ☐

Le Français est la seule langue que je parle couramment ☐

Je connais d'autre(s) langue(s) ☐

.....

Je parle couramment d'autre(s) langue(s) ☐

.....

Autres commentaires concernant mon histoire linguistique (par exemple : éducation bilingue, parents sourds, etc.)

.....

.....

.....

Dans ce test cognitif, il vous est demandé de juger des films en fonction de leur degré de similarité.

Dans un instant, vous allez voir une série de clips vidéos à la télévision.
Chaque clip est court et muet.

Les clips vidéos sont organisés par groupes de 3,
par exemple, groupe 1 comprend 3 clips vidéos A, B, et C, et
 groupe 2 comprend 3 clips vidéos A, B, et C, etc.

Il y a 15 groupes au total.

Vous allez voir 1 groupe de 3 clips vidéos à la fois.

Une fois que vous avez regardé un groupe, votre premier exercice est de décrire ce que vous avez vu sur l'écran de télévision ; ensuite, vous devez juger/ décider quels sont les 2 clips parmi les 3 présentant le plus de similitudes; par exemple, vous pouvez décider d'associer A & B, A & C, ou B & C.

Les critères de choix vous appartiennent entièrement.

Il n'y a ni bonnes ni mauvaises réponses.

Et il n'y a pas de piège. Cet exercice ne teste en aucun cas votre intelligence ou vos aptitudes générales.

- (1) Décrivez chaque clip vidéo, et
(2) Encerclez les lettres correspondant aux deux clips vidéos que vous avez choisi d'associer.

GROUPE [1]

A
B
C

GROUPE [2]

A
B
C

GROUPE [3]

A
B
C

GROUPE [4]

A
B
C

GROUPE [5]

A
B
C

GROUPE [6]

A
B
C

GROUPE [7]

A
B
C

GROUPE [8]

- A
- B
- C

GROUPE [9]

- A
- B
- C

GROUPE [10]

- A
- B
- C

GROUPE [11]

- A
- B
- C

GROUPE [12]

- A
- B
- C

GROUPE [13]

- A
- B
- C

GROUPE [14]

- A
- B
- C

GROUPE [15]

- A
- B
- C

APPENDIX F – DRAWING SUBJECTS

	NAME	GENDER	AGE	OCCUPATION	NATIVE LANGUAGE
1	CHRISTOPHE	M	28	UNIVERSITY	French
2	TAOUFIK	M	34	UNIVERSITY	French
3	J-PHIL	M	26	UNIVERSITY	French
4	VINCENT	M	20s	UNIVERSITY	French
5	EMMANUEL	M	30	UNIVERSITY	French
6	ANTOINE	M	30	UNIVERSITY	French
7	QUENTIN	M	20s	UNIVERSITY	French
8	CLEMENT	M	30	UNIVERSITY	French
9	SAMUEL	M	20s	UNIVERSITY	French
10	CEDRIC	M	20s	UNIVERSITY	French
11	JEAN-LUC	M	30	UNIVERSITY	French
12	AUDES	F	24	UNIVERSITY	French
13	LAETITIA	F	28	UNIVERSITY	French
14	FLORELLE	F	24	UNIVERSITY	French
15	CAROLE	F	24	UNIVERSITY	French
16	MARIE-LISE	F	22	UNIVERSITY	French
17	CLAIRE	F	23	UNIVERSITY	French
18	CAROLINE	F	20s	UNIVERSITY	French
19	MARION	F	20s	UNIVERSITY	French
20	CARO	F	30	UNIVERSITY	French
21	DELPHINE	F	20s	UNIVERSITY	French
22	LIDIA	F	20s	UNIVERSITY	French
23	MARIE	F	20s	UNIVERSITY	French
24	CELINE	F	20s	UNIVERSITY	French
25	JUDITH	F	20s	UNIVERSITY	French
1	KEITH	M	20	TRADE	English
2	CHRIS	M	20s	TEACHER	English
3	SIMON	M	20s	UNIVERSITY	English
4	MATT	M	20s	UNIVERSITY	English
5	CHRIS J	M	20s	UNIVERSITY	English
6	COLM	M	20s	UNIVERSITY	English
7	SHANE	M	34	UNIVERSITY	English
8	LANI	F	20s	UNIVERSITY	English
9	VICKY	F	20s	UNIVERSITY	English
10	JEN	F	20s	UNIVERSITY	English
11	HELEN T	F	20s	UNIVERSITY	English
12	MELINDA	F	30s	UNIVERSITY	English
13	LUCY	F	20s	UNIVERSITY	English
14	ROWENA	F	20s	UNIVERSITY	English
15	MICHELLE	F	20s	UNIVERSITY	English
16	RACH	F	20s	UNIVERSITY	English
17	CHRISTINE	F	20s	UNIVERSITY	English
18	HELEN K	F	20s	UNIVERSITY	English
19	REBECCA	F	20s	UNIVERSITY	English

APPENDIX G – MEMORY SUBJECTS

	NAME	GENDER	AGE	OCCUPATION	NATIVE LANGUAGE
1	CHRISTOPHE	M	28	UNIVERSITY	French
2	TAOUFIK	M	34	UNIVERSITY	French
3	J-PHIL	M	26	UNIVERSITY	French
4	VINCENT	M	20s	UNIVERSITY	French
5	EMMANUEL	M	30	UNIVERSITY	French
6	ANTOINE	M	30	UNIVERSITY	French
7	QUENTIN	M	20s	UNIVERSITY	French
8	CLEMENT	M	30	UNIVERSITY	French
9	SAMUEL	M	20s	UNIVERSITY	French
10	CEDRIC	M	20s	UNIVERSITY	French
11	JEAN-LUC	M	30	UNIVERSITY	French
12	CYRIL	M	30	TRADE	French
13	STEPHANE	M	20s	TRADE	French
14	OLIVIER	M	30s	TRADE	French
15	SEBASTIEN	M	30	TRADE	French
16	AUDES	F	24	UNIVERSITY	French
17	LAETITIA	F	28	UNIVERSITY	French
18	FLORELLE	F	24	UNIVERSITY	French
19	CAROLE	F	24	UNIVERSITY	French
20	MARIE-LISE	F	22	UNIVERSITY	French
21	CLAIRE	F	23	UNIVERSITY	French
22	CAROLINE	F	20s	UNIVERSITY	French
23	MARION	F	20s	UNIVERSITY	French
24	CARO	F	30	UNIVERSITY	French
25	DELPHINE	F	20s	UNIVERSITY	French
26	LIDIA	F	20s	UNIVERSITY	French
27	MARIE	F	20s	UNIVERSITY	French
28	CELINE	F	20s	UNIVERSITY	French
29	JUDITH	F	20s	UNIVERSITY	French
30	ALINE	F	25	TRADE	French
31	CHANTAL	F	50	ADMINISTRATION	French
32	STEPHANIE	F	30	TEACHER	French
33	CHRISTINE	F	30	TRADE	French
1	KEITH	M	20	TRADE	English
2	CHRIS	M	20s	TEACHER	English
3	SIMON	M	20s	UNIVERSITY	English
4	MATT	M	20s	UNIVERSITY	English
5	CHRIS J	M	20s	UNIVERSITY	English
6	COLM	M	20s	UNIVERSITY	English
7	SHANE	M	34	UNIVERSITY	English
8	MICHAEL	M	24	UNIVERSITY	English
9	RUSSELL	M	20s	UNIVERSITY	English
10	JAMES	M	20s	UNIVERSITY	English
11	DAVID	M	20s	UNIVERSITY	English

12	JONNY	M	20s	UNIVERSITY	English
13	MARKUS	M	20s	UNIVERSITY	English
14	LANI	F	20s	UNIVERSITY	English
15	VICKY	F	20s	UNIVERSITY	English
16	JEN	F	20s	UNIVERSITY	English
17	HELEN T	F	20s	UNIVERSITY	English
18	MELINDA	F	30s	UNIVERSITY	English
19	LUCY	F	20s	UNIVERSITY	English
20	LEXY	F	20s	UNIVERSITY	English
21	MICHELLE	F	20s	UNIVERSITY	English
22	RACH	F	20s	UNIVERSITY	English
23	PHILIPPA	F	20s	UNIVERSITY	English
24	HELEN K	F	20s	UNIVERSITY	English
25	SALLY	F	20s	UNIVERSITY	English
26	HALEY	F	20s	UNIVERSITY	English
27	HEATHER	F	20s	UNIVERSITY	English
28	ANNA G	F	30	UNIVERSITY	English
29	ANNA L	F	20s	UNIVERSITY	English

APPENDIX H – CHARLIE CHAPLIN STIMULUS SCRIPT

***CITY LIGHTS* The meeting with the millionaire**

SCENE

Set at night - dark
 Black & white film
 Stairway on the right with lamp at the top
 Platform at the bottom of the stairs
 River on the left of the screen
 23 main events

A. THE MILLIONAIRE'S ENTRANCE

- Staggering down the stairs
- The suitcase
 1. Man coming down the stairs
 2. carrying a heavy suitcase & a cane
 3. Black evening dress & hat
 4. Leaning against the wall for support
 5. Wobbly walk

B. UNPACKING THE SUITCASE

- Opening the suitcase
- Tying the rope around his neck
 1. On the platform
 2. Kneeling on the ground, facing camera
 3. Cane on the floor on his left (our right)
 4. Puts the suitcase in front of him
 5. Opens it
 6. Contains rock & rope
 7. First takes out the rope, in which there is a noose
 8. He stands
 9. he ties it around his neck

C. CHARLIE CHAPLIN'S ENTRANCE

- Walking down the stairs 1 step at a time
- Salute
- Dusting the bench
- Sitting
- Smelling a flower
 1. The man faces round to the left
 2. Charlie Chaplin's entry, down the stairs
 3. Walking down one step at a time (4 in a row with each foot)
 4. Has a cane and hat
 5. Doves his hat to the man
 6. Turns away from the man to face the right-hand side of the screen, where a bench is
 7. He pulls out a hankie
 8. he dusts the bench
 9. Turns round and sits cross-legged
 10. Stares ahead – not at the man – at the river
 11. Takes a flower from his buttonhole
 12. sniffs the flower
 13. The man stares at him all along with the rope tight around his neck

D. THE ROPE

- ties the rope to the rock
 - Charlie Chaplin looks concerned
 - the man sways back and forth with the rock
1. The man faces away back to the camera and proceeds
 2. Kneels down
 3. pulls a stone out of the case
 4. Kicks the suitcase out of the way whilst holding the stone
 5. Kneels
 6. ties the loose end of the rope around the stone (double-knot)
 7. Charlie Chaplin notices and stares at him, his eyebrows lifting up and down,
 8. all the while smelling his flower
 9. The man picks up the tied rock, faces the river (back to Charlie Chaplin),
 10. staggers backwards 2 steps, and then forwards

E. CHARLIE INTERVENES

- Charlie Chaplin stops the millionaire
 - the stone gets dropped
1. Charlie Chaplin runs to the front of the man and stops him
 2. The man drops the stone onto Charlie Chaplin's right foot
 3. Charlie Chaplin hops around away from the man
 4. clutching his right foot in both hands
 5. The man faces the camera with one hand to his forehead – in despair
 6. Charlie Chaplin returns to the man still hopping

F. CHARLIE'S WISE WORDS

- Charlie Chaplin reasons the millionaire
 - Charlie Chaplin undoes the rope from his neck
1. Charlie Chaplin looks at the stone, then at the man
 2. He talks to the man,
 3. and undoes the noose from around his neck,
 4. looks at the rope, and back at the man
 5. The man is swaying
 6. Charlie Chaplin is talking to him all along
 7. TOMORROW THE BIRDS WILL SING
 8. Charlie Chaplin is looking upwards, the man straight ahead
 9. The man then cries, both hands to his face
 10. Charlie Chaplin looks at the man
 11. BE BRAVE FACE LIFE
 12. Charlie Chaplin pats himself across the chest, and coughs
 13. The man is still crying
 14. Charlie Chaplin puts his arm around him

G. THE SUICIDE ATTEMPT

- the millionaire takes the rope back
 - the millionaire throws the rope around both necks
 - the millionaire slips out of the loop
1. The man flings open his arms
 2. NO I'LL END IT ALL
 3. Snatches the noose back
 4. Flings it around both their necks (Charlie Chaplin is behind still hugging him)
 5. The man bends to the ground to pick up the stone
 6. slips out of the noose
 7. Charlie Chaplin is still talking

H. CHARLIE'S FIRST SWIMMING SESSION

Charlie Chaplin does in the water

1. The man throws the stone in the river
2. Charlie Chaplin goes flying into the water
3. The man remains standing on the bank

I. THE MILLIONAIRE'S INDECISION

- the millionaire decides to save Charlie Chaplin
 - he takes off his jacket
1. He steps forward and shouts something
 2. Turns round to the bench
 3. Undoes his jacket
 4. throws it on to the ground
 5. He looks back at the river

J. CHARLIE'S DROWNING

- Charlie Chaplin's feet surface out of the water
 - the millionaire starts to take off his shoes
 - Charlie Chaplin's head surfaces out of the water
1. Feet are coming out of the surface
 2. The man goes to the bench
 3. sits down to undo his shoes (right foot shoe)
 4. Shot back to the river – bubbles
 5. Charlie Chaplin's head surfaces

K. THE MILLIONAIRE'S FIRST SWIMMING SESSION

- the millionaire lends Charlie Chaplin a hand
 - he gets pulled in
1. The man rushes back to the bank – shoes not undone
 2. The man lends his hand to pull him out
 3. But the man is pulled in and falls into the water

L. THE DEBACLE

- both men mess about in the water
- Charlie Chaplin climbs over the millionaire
 1. In the water, he pulls Charlie Chaplin out by the hair
 2. Charlie Chaplin clings onto the man's arm
 3. They're swimming towards the bank
 4. The man reaches it first
 5. Charlie Chaplin is under water, surfaces and clings onto his shirt,
 6. which causes the man to slip his grip off the bank
 7. Charlie Chaplin climbs on top of the man to reach the bank
 8. The man is submerged under water as a result
 9. Charlie Chaplin seems to be getting out first

M. DRY LAND

the millionaire helps Charlie Chaplin out onto the bank

1. They're both pulling themselves up the bank
2. The millionaire makes it onto the ground first
3. And pulls Charlie Chaplin up out of the water
4. They're both on their feet – Charlie Chaplin closest to the water

N. GRATITUDE

- the millionaire shakes Charlie Chaplin's hand
- both men bend down in opposite directions to fetch their belongings
 1. They shake hands, facing each other
 2. The man pats Charlie Chaplin on the shoulder with his right hand
 3. And holds Charlie Chaplin's jacket with his left
 4. He turns round looking for his own jacket
 5. He sees it on the ground
 6. He turns and bends down to pick it up
 7. Charlie Chaplin turns the other direction – facing the river
 8. and bends down to pick up his hat

O. CHARLIE'S SECOND SWIMMING SESSION

the millionaire bumps Charlie Chaplin into the water

1. The man steps backwards
2. And bumps into Charlie Chaplin
3. Charlie Chaplin heads right into the water

P. THE MILLIONAIRE'S SECOND SWIMMING SESSION

- the millionaire offers his hand
- he gets pulled in again
 1. The man turns round holding his jacket
 2. He throws it onto the ground
 3. He leans over the bank
 4. He offers his hand to Charlie Chaplin
 5. He falls in again

Q. THE DEBACLE II

- both men mess about in the water
 - Charlie Chaplin climbs over the millionaire
 - the millionaire helps Charlie Chaplin out of the water
1. They're both in the water
 2. Charlie Chaplin hangs on to the man's back
 3. Charlie Chaplin climbs on top of him
 4. They both reach the bank and pull themselves up
 5. The man is out first
 6. The man helps Charlie Chaplin pulling him out by his trousers and his jacket
 7. Charlie Chaplin is on dry land bent forward – looking exhausted

R. FRIENDSHIP

- both men shake hands and make friends
 - the millionaire sways back and forth near the water
1. The man shakes his hand
 2. I'M CURED, YOU'RE MY FRIEND FOR LIFE
 3. He pats Charlie Chaplin on the shoulder
 4. He leans forward to hug Charlie Chaplin, shifting all his weight onto him
 5. Charlie Chaplin catches him and pushes him back away from the river
 6. Charlie Chaplin turns around to the other side of the man so that he's facing the river and the man is now closer to the bank
 7. The man is still holding on to Charlie Chaplin

S. SMARTENING UP

- Charlie Chaplin catches him on a near miss
 - both men gather their belongings
 - they prepare to leave for home
1. He turns round and bends forward to pick up Charlie Chaplin's hat
 2. He lifts up one foot in doing so, and tips himself off balance back towards the river
 3. Charlie Chaplin catches him by the left foot
 4. Charlie Chaplin holds on to his body as the man stands back up holding the hat in his hands
 5. The man turns to face Charlie Chaplin
 6. He puts the hat on Charlie Chaplin's head
 7. He swings back and forth and away from Charlie Chaplin to pick up his own hat, cane and jacket
 8. Charlie Chaplin is stepping on one foot and then on the other trying to shake the water off his trousers
 9. His stick is being handed over to him
 10. The other man raises his own stick up in the air
 11. WE'LL GO HOME AND GET WARMED UP

T. THE POLICEMAN'S ENTRANCE

a policeman enters the scene

1. A policeman appears in the background emerging out of the shadow
2. Charlie Chaplin and the man start walking arm in arm towards the stairs
3. The policeman is approaching – strolling
4. He's got a stick in his hand
5. He then puts both his hands behind his back
6. He turns to face them

U. THE EXIT

Both men head for the stairs, arm in arm

1. Both characters face the policeman and make for the exit
2. The man is closer to the wall and Charlie Chaplin is between the 2 men
3. The man is further up the steps and Charlie Chaplin is following still holding his arm
4. Charlie Chaplin swings his stick in his left hand
5. Charlie Chaplin walks up one step at a time

V. THE FLOWER

- Charlie Chaplin realises he's forgotten his flower on the bench
 - he goes back down the steps to fetch it
1. Charlie Chaplin turns round 1/3 way up the stairs
 2. Charlie Chaplin points to the bench behind them on the platform
 3. Charlie Chaplin walks back down the steps – 1 at a time
 4. Charlie Chaplin picks up his flower on the bench
 5. Charlie Chaplin turns round

W. THE END

- both men walk up the stairs away from the police officer
 - The End!
1. Charlie Chaplin doves his hat to the policeman
 2. Charlie Chaplin walks back up the steps – 1 at a time
 3. Charlie Chaplin hangs on to the man
 4. Charlie Chaplin is hopping up the last step at the end of the scene
 5. The policeman watches them all along from the bottom of the stairs

APPENDIX I – CHARLIE CHAPLIN RECOGNITION QUESTIONNAIRE

1. First, could you describe what is on the scene grounds at the very start? There's a river, for instance, where is it?

River	Stairs	Bench	Platform	Ladder	Lamp post

2. How many times does Chaplin go into the water? 1 ☐ 2 ☐ 3 ☐
3. Does the millionaire dive into the water to rescue Chaplin? yes ☐ no ☐
4. Who arrives first on the scene? Charlie ☐ millionaire ☐
5. Does Chaplin walk down the stairs one step at a time? yes ☐ no ☐
6. If so, how many steps in a row does he take with his right foot first? And then with his left foot? 1 ☐ 2 ☐ 3 ☐
7. How many protagonists appear in the whole scene? 1 ☐ 2 ☐ 3 ☐
8. Do both men have a hat? yes ☐ no ☐
9. How best can you describe the manner in which the millionaire walks?
.....
10. How many times does the millionaire go into the water? 1 ☐ 2 ☐ 3 ☐
.....
11. Does the millionaire give his friendship to Chaplin after the first or after the second fall into the water? 1st ☐ 2nd ☐
12. At one point, Charlie attempts to reason the millionaire and he tells him very eloquently that the birds will sing tomorrow. Whilst he makes his speech, he's looking somewhere: do you know where or what?
13. Is it the millionaire who causes Chaplin to fall in the water the first time? yes ☐ no ☐
14. Is it the millionaire who causes Chaplin to fall in the water the 2nd time? yes ☐ no ☐
15. Do both men carry a walking stick? yes ☐ no ☐
16. Is the millionaire drunk? yes ☐ no ☐
17. Is Charlie Chaplin drunk? yes ☐ no ☐
18. What makes you think that the millionaire is drunk, but not Charlie?
.....

19. Does the millionaire take off his shoes at some point? yes ☐ no ☐
20. What does the millionaire take out of his suitcase?
21. How does he then get rid off his case?
22. The second time when Chaplin falls into the water, is he facing the water or does he have his back to it, or is he sideways? facing ☐ back ☐ side ☐
23. A policeman arrives. Where does he come from? and where is he going?
.....
24. Is the policeman running when he approaches the two men? yes ☐ no ☐
25. How do the millionaire and Chaplin exit the scene?
.....
26. Chaplin forgets one thing behind. What is it? And where is it?
.....
27. Does he go running to fetch it back? yes ☐ no ☐
28. How does Charlie Chaplin manage to get out of the water each time?
.....
29. How does Charlie Chaplin react when the stone is dropped on his foot?
.....
30. Does he hop on one spot? Or spinning ? or something else ?
on the spot ☐ spinning ☐ other ☐
31. When Charlie attempts to stop the man from throwing himself into the water, does he go running or walking towards him? walking ☐ running ☐

1. Pouvez-vous, tout d’abord, me décrire ce qui se trouve sur le plan de la scène au tout début ? il y a une rivière, par exemple, où est-elle située ? (escalier, banc, plate-forme, échelle, lampadaire).

Rivière	Escalier	Banc	Plate-forme	Echelle	Lampadaire

2. Combien de fois Charlie tombe-t-il à l’eau? 1 ☐ 2 ☐ 3 ☐
3. Le millionnaire, plonge-t-il à l’eau pour secourir Charlie? oui ☐ non ☐
4. Qui arrive le premier sur la scène? Charlie ☐ millionnaire ☐
5. Est-ce que Charlie descend les escaliers une marche à la fois? oui ☐ non ☐
6. Si oui, combien de marches d’affilée prend-il d’abord avec le pied droit puis avec le pied gauche? 1 ☐ 2 ☐ 3 ☐
7. Combien de personnages sont présents dans la scène? 1 ☐ 2 ☐ 3 ☐
8. Est-ce que les 2 hommes ont un chapeau ? oui ☐ non ☐
9. Comment décririez-vous la manière dont le millionnaire marche?
.....
10. Combien de fois le millionnaire tombe-t-il à l’eau? 1 ☐ 2 ☐ 3 ☐
11. Le millionnaire donne-t-il son amitié à Charlie Chaplin après la première chute à l’eau, ou après la 2^{ème} ? 1^{ère} ☐ 2^{ème} ☐
12. A un moment donné, Charlie tente de raisonner le millionnaire et lui dit avec éloquence que les oiseaux chanteront demain. Il fait son discours en regardant quelque part : où regarde-t-il, ou que regarde-t-il ?
13. Est-ce le millionnaire qui est responsable de la 1^{ère} chute à l’eau de Charlie? oui ☐ non ☐
14. Est-ce le millionnaire qui est responsable de la 2^{ème} chute à l’eau de Charlie? oui ☐ non ☐
15. Est-ce que les 2 hommes ont une canne? oui ☐ non ☐
16. Le millionnaire est-il ivre? oui ☐ non ☐
17. Charlie Chaplin est-il ivre? oui ☐ non ☐

18. Qu'est-ce qui vous fait penser que le millionnaire est ivre, mais pas Charlie?
.....
19. Le millionnaire enlève-t-il ses chaussures à un moment donné? oui ☐ non ☐
20. Que sort le millionnaire de sa valise?
21. Comment se débarrasse-t-il de sa valise?
22. La 2^{ème} fois que Charlie Chaplin tombe à l'eau, est-il face à l'eau ? de dos à l'eau? ou de côté?
face ☐ dos ☐ côté ☐
23. Un policier arrive. D'où surgit-il? et où va-t-il?
.....
24. Le policier arrive-t-il en courant vers les 2 personnages? oui ☐ non ☐
25. Comment est-ce que le millionnaire et Charlie Chaplin quittent la scène?
.....
26. Charlie oublie quelque chose derrière lui. Qu'est-ce? Où est-ce?
.....
27. Est-ce qu'il va la chercher en courant? oui ☐ non ☐
28. Comment est-ce que Charlie arrive à sortir de l'eau chaque fois ?
.....
29. Comment Charlie réagit-il quand la pierre lui tombe sur le pied ?
.....
30. Saut-t-il sur place? en tournant sur lui-même? ou autrement?
sur place ☐ en tournant ☐ autre ☐
31. Quand Charlie intervient pour empêcher le millionnaire de se jeter à l'eau, va-t-il à son
encontre en marchant ou en courant? marchant ☐ courant ☐

APPENDIX J – GRAMMATICALITY JUDGEMENT TESTS

Jugements Linguistiques 2003

AGE

SEXE

PROFESSION.....

LANGUE(S) MATERNELLE(S)

CONNAISSEZ-VOUS D'AUTRES LANGUES ? LESQUELLES ?

.....

PARLEZ-VOUS COURAMMENT D'AUTRES LANGUES? LESQUELLES?

.....

PARLEZ-VOUS D'AUTRES LANGUES RÉGULIÈREMENT? LESQUELLES?

.....

RÉGION D'HABITATION

DEPUIS COMBIEN DE TEMPS VIVEZ-VOUS DANS CETTE RÉGION?

AVEZ-VOUS VÉCU DANS D'AUTRES RÉGIONS? SI OUI, LESQUELLES ET PENDANT COMBIEN DE TEMPS?

.....

.....

.....

.....

.....

Nous aimerions savoir ce que vous pensez des phrases ci-dessous, c'est à dire, vous semblent-elles correctes, acceptables, ou complètement incorrectes. Si vous hésitez, demandez-vous simplement s'il pourrait vous arriver de prononcer ces phrases dans la vie de tous les jours. N'oubliez pas que ce test est anonyme, et que nous ne considérons pas qu'il y ait de 'mauvaise' réponse; nous nous intéressons à vos intuitions! Pour cela, veuillez cocher la case qui vous semble appropriée dans les phrases suivantes (incorrect = 1 ; correct = 5).

	1	2	3	4	5
1. Marc court dans la rue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Anne court en passant par le parc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Cécile marche le long de la route	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Marc traverse la rivière à la nage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1	2	3	4	5
5. Cécile descend la pente à vélo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. L' oiseau vole à travers la mer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Marc monte les escaliers sur la pointe des pieds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Cécile ferme la porte avec le pied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Le cheval galope en venant vers la prairie	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Marc tire le paquet de dessous le lit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Cécile pédale à vélo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Marc pédale à vélo en montant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Cécile marche en traversant la rue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Marc fait coulisser la porte pour la fermer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. L'enfant sautille an allant à l'école	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Cécile glisse un objet sous le canapé	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Pierre court en descendant les escaliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Marc longe le trottoir à pied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Grosminet rampe en descendant les escaliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Titi sort de sa cage en volant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Marc boîte chez lui	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Cécile titube hors de la maison	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Jean court en traversant la rue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Karine claque la porte fermée	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Paul monte la rue à vélo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Martine nage à travers la rivière	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Le camion roule Grosminet à plat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Titi sautille de haut en bas des marches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1	2	3	4	5
29. Jacques marche le long de la route en montant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Philipe nage en traversant le fleuve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Les enfants vont à l'école en trépignant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. La barque flotte en s'approchant de la rive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Christelle traverse la cour en gambadant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Avez-vous trouvé le test facile/ difficile?.....

Quelles phrases étaient plus difficiles?.....

Autres commentaires?
.....
.....
.....
.....
.....
.....

MILLE MERCIS !!!

Jugements Linguistiques 2004

AGE

SEXE

PROFESSION.....

LANGUE(S) MATERNELLE(S)

CONNAISSEZ-VOUS D'AUTRES LANGUES ? LESQUELLES ?

.....

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.....

PARLEZ-VOUS D'AUTRES LANGUES RÉGULIÈREMENT? LESQUELLES?

.....

RÉGION D'HABITATION

DEPUIS COMBIEN DE TEMPS VIVEZ-VOUS DANS CETTE RÉGION?

AVEZ-VOUS VÉCU DANS D'AUTRES RÉGIONS? SI OUI, LESQUELLES ET PENDANT COMBIEN DE TEMPS?

.....

.....

.....

.....

.....

Nous aimerions savoir ce que vous pensez des phrases ci-dessous, c'est à dire, vous semblent-elles acceptables ou inacceptables. Si vous hésitez, demandez-vous simplement s'il pourrait vous arriver de prononcer ces phrases dans la vie de tous les jours. N'oubliez pas que ce test est anonyme, et que nous ne considérons pas qu'il y ait de 'mauvaise' réponse; nous nous intéressons à vos intuitions! Pour cela, veuillez cocher la case qui vous semble appropriée dans les phrases suivantes (acceptable = 1; non acceptable = 5).

	1	2	3	4	5
1. Marc a plongé dans le lac	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Le chocolat a dégouliné sur la table	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Martine a nagé à travers la rivière	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Le tonneau a dégringolé dans la cave en roulant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. La bouteille flottait en entrant dans la cave	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1	2	3	4	5
6. Cécile courait dans le jardin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Le chat a grimpé dedans [dans le panier à linge]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Le ballon a roulé sous la table	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Marc a monté les escaliers sur la pointe des pieds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Cécile a claqué la porte d'un coup violent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Le cheval a dévalé la prairie au trot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Le vers a rampé sous terre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. En vacillant, Paul a basculé dans le vide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. L'âne trottait en traversant le chemin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Max a couru dans la maison quand le téléphone a sonné	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. L'enfant sautillait en allant à l'école	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Le ballon roulait dans le fossé	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Jean a trébuché par terre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Emma a dévalé les escaliers en courant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Pierre a couru jusqu'en bas de l'escalier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Marc a longé le trottoir à vélo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Grosminet rampait en descendant les escaliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. L'oiseau est sorti de sa cage en volant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Les enfants sont allés dehors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Cécile a titubé hors de la maison	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Jean a couru en sortant dans la rue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Le voleur s'est échappé de la banque en sortant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Le cheval a sauté par-dessus la barrière	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Avez-vous trouvé le test facile/ difficile?

Quelles phrases étaient plus difficiles?

Autres commentaires?

.....

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.....

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MERCI DE VOTRE PARTICIPATION !!!

REFERENCES

ACADEMIC

- AARSLEFF, H. (1988) Introduction. In W. von Humboldt (ed.) *On Language*. vii-xxxiv. Cambridge: Cambridge University Press.
- ALFORD, D. (1980) Demise of the Whorf hypothesis. *Phoenix: New Directions in the Study of Man*, 4: 85-91.
- ____ (1981) Is Whorf's relativity Einstein's relativity? *Proceedings of the Seventh Annual Meeting of the Berkeley Linguistics Society*. 13-26.
- ____ (1995) Sapir-Whorf and what to tell students these days. *Linguist List* 6.1149. <http://linguistlist.org/issues/6/6-1149.html>
- ASKE, J. (1989) Path predicates in English & Spanish: a closer look. *Proceedings of the Fifteenth Annual Meeting of the Berkeley Linguistics Society*. 1-14.
- AU, T.K. (1983) Chinese & English counterfactuals: The Sapir-Whorf hypothesis revisited. *Cognition*, 15: 155-87.
- ____ (1984) Counterfactuals: In reply to Alfred Bloom. *Cognition*, 17: 289-302.
- BECHTEL, W. (1990) Connectionism & the philosophy of mind: An overview. In W.G. Lycan (ed.) *Mind & Cognition: A Reader*. 252-73. Cambridge, MA: Basil Blackwell.
- BERKELEY, G. (1948-1957) *Works*. London: Nelson
- BERLIN, B. & P. KAY (1969) *Basic Color Terms*. Berkeley: University of California Press.
- BERMAN, R.A. & D.I. SLOBIN (1994) *Relating Events in Narrative: A Cross-Linguistic Developmental Study*. Hillsdale, NJ: LEA.
- BICKERTON, D. (1990) *Language & Species*. Chicago: Chicago University Press.
- BLACK, M. (1969) Some troubles with Whorfianism. In S. Hook (ed.) *Language & Philosophy*. 30-5. New York: New York University Press.
- BLACKWELL, T. (1735) *An Enquiry into the Life and Writings of Homer*. London.
- BLOOM, A.H. (1981) *The Linguistic Shaping of Thought: A Study of the Impact of Language on Thinking in China & the West*. Hillsdale, NJ: Erlbaum.
- ____ (1984) Caution – the words you use may affect what you say: A response to Au. *Cognition*, 17: 275-87.
- BOAS, F. (1888) *The Central Eskimo*. Washington, DC: Bureau of American Ethnology Annual Report, 6.
- ____ (1910) Psychological problems in anthropology. *Journal of Psychology*, 21: 371-84.
- ____ (1911) *The Mind of Primitive Man*. New York: Macmillan.
- ____ (1942) Language & culture. *Studies in the History of Culture: The Disciplines of the Humanities*. 178-84. Menasha, WI: George Banta.
- ____ (1966) *Handbook of American Indian Languages*. Lincoln, NE: University of Nebraska Press.
- ____ (1974) *The Shaping of American Anthropology*. New York: Basic Books.

- BOHNEMEYER, J., S. EISENBEISS & B. NARASIMHAN (2004) Manner & path in non-linguistic cognition. Conference presentation, Language, Culture & Mind, Portsmouth, 19.07.04.
- BOURDIEU, P. (1991) *Language & Symbolic Power*. Oxford: Blackwell.
- BRINTON, D.G. (1885) The philosophic grammar of American languages, as set forth by Wilhelm von Humboldt; with the translation of an unpublished memoir by him on the American verb. *Proceedings of the American Philosophical Society*, 22: 306-54.
- ____ (1891) *The American Race: A Linguistic Classification & Ethnographic Description of the Native Tribes of North & South America*. New York: Hodges.
- BROWN, P. & S.C. LEVINSON (1987) *Politeness: Some Universals in Language Usage*. Cambridge: Cambridge University Press.
- BROWN, R.L. (1967) *Wilhelm von Humboldt's Conception of Linguistic Relativity*. The Hague: Mouton.
- BROWN, R.W. (1957) Linguistic determinism & the part of speech. *Journal of Abnormal and Social Psychology*, 55: 1-5.
- ____ (1958) *Words and Things*. New York: MacMillan Press.
- ____ (1976) Reference: in memorial tribute to Eric Lenneberg. *Cognition*, 4: 125-53.
- BROWN, R.W. & E.H. LENNEBERG (1954) A study in language & cognition. *Journal of Abnormal and Social Psychology*, 49: 454-62.
- BRUNER, J.S., J.S. GOODNOW & G.A. AUSTIN (1962) *A Study of Thinking*. New York: Wiley.
- CARROLL, J.B. (1956) Introduction. In J.B. Carroll (ed.) *Language, Thought, & Reality*. 1-34. Cambridge, MA: MIT Press.
- CARROLL, J.B. & J.B. CASAGRANDE (1958) The functions of language classifications in behavior. In E.E. Maccoby, T.M. Newcomb, & E.L. Hartley (eds.) *Readings in Social Psychology*. 18-31. London: Methuen.
- CASAGRANDE, J.B. (1960) The Southwest project in comparative psycholinguistics: a preliminary report. In A. Wallace (ed.) *Men & Cultures*. 777-82. Philadelphia: University of Pennsylvania Press.
- CASSON, R.W. (1981) *Language, Culture, and Cognition: Anthropological Perspectives*. New York: MacMillan Publishers.
- CHAN, A. & B. BERGEN (2004) Writing direction & the universality of image schemas. Conference presentation, EMCL Workshop: Image-schemas & Linguistic Relativity, Portsmouth, 18.07.04.
- CHOI, S. & M. BOWERMAN (1991) Learning to express motion events in English & Korean: the influence of language-specific lexicalisation patterns. *Cognition*, 41: 83-121.
- CHOMSKY, N. (1957) *Syntactic Structures*. The Hague: Mouton.
- ____ (1965) *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.
- CLARK, A. (1998) Magic words: How language augments human computation. In P. Carruthers & J. Boucher (eds.) *Language & Thought*. 162-83. Cambridge: Cambridge University Press.

- CLAUSNER, T.C. & W. CROFT (1999) Domains & image-schemas. *Cognitive Linguistics*, 10: 1-31.
- CLOEREN, H.J. (1988) *Language and thought: German approaches to analytic philosophy in the 18th and 19th centuries*. Berlin: Mouton de Gruyter.
- CONDILLAC, E.B. de (1987) *Philosophical Writings*. Hillsdale, NJ: Laurence Erlbaum.
- CROFT, W. & D.A. CRUSE (2004) *Cognitive Linguistics*. Cambridge: Cambridge University Press.
- DARNELL, R. (1970) The emergence of academic anthropology at the University of Pennsylvania. *Journal of the History of the Behavioural Sciences*, 6: 80-92.
- ____ (1998) *And Along Came Boas: Continuity & Revolution in Americanist Anthropology*.
- DANZIGER, E. (2001) *Relatively Speaking: Language, Thought, & Kinship among the Mopan Maya*. Oxford: Oxford University Press.
- DELANCEY, S. (1989) Klamath stem structure in genetic & areal perspective. *Papers from the 1988 Hoka-Penutian Languages Workshop*: 31-9.
- DIRVEN, R. & M. VERSPOOR (1998) *Cognitive Explorations of Language and Linguistics*. Amsterdam: John Benjamins.
- DOWKER, A. & D. LLOYD (in press) Linguistic influences on numeracy: The case of Welsh. *Educational Transactions*.
- DUNBAR, R. (1996) *Grooming, Gossip, & the Evolution of Language*. London: Faber.
- DURANTI, A. (1997) *Linguistic Anthropology*. Cambridge: Cambridge University Press.
- EINSTEIN, A. (1954) *Ideas & Opinions*. New York: Crown.
- EYSENCK, M.W. & M.T. KEANE (1997) *Cognitive Psychology*. Hove, UK: Psychology Press.
- FABRE D'OLIVET, A. (1991) *La langue hébraïque restituée*. Paris: Editions l'Age d'Homme.
- FILLMORE, C. (1982) Frame semantics. In Linguistic Society of Korea (ed.) *Linguistics in the Morning Calm*. 111-37. Seoul: Hanshin.
- FODOR, J. (1985) Précis & multiple book review of *The Modularity of Mind*. *Behavioural & Brain Sciences*, 8: 1-42.
- FODOR, J., J. FODOR & M. GARRETT (1975) The unreality of semantic representations. *Linguistic Inquiry*, 4: 515-31.
- FOLEY, W.A. (1997) *Anthropological Linguistics*. Oxford: Blackwell.
- FRIEDRICH, P. (1974) On aspect theory & Homeric aspect. *International Journal of American Linguistics*, 40 (2, part 2, memoir 28).
- ____ (1980) Linguistic relativity & the order-to-chaos continuum. In J. Macquet (ed.) *On Linguistic Anthropology*. 89-139. Malibu, CA: Undena.
- ____ (1986) *The Language Parallax*. Austin, TX: University of Texas Press.
- GENNARI, S.P., S.A. SLOMAN, B.C. MALT & W.T. FITCH (2002) Motion events in language & cognition. *Cognition*, 83: 49-79.
- GENTNER, D. (2003) Why we're so smart. In D. Gentner & S. Goldin-Meadow (eds.) *Language in Mind: Advances in the Study of Language & Thought*. 195-235. Cambridge, MA: MIT Press.

- GOLDSTONE, R. (1994) Influences of categorization on perceptual discrimination. *Journal of Experimental Psychology: General*, 123(2): 178-200.
- GRACE, G.W. (1987) *The Linguistic Construction of Reality*. New York: Croom Helm.
- GRICE, H.P. (1969) Utterer's Meaning and Intention. *Philosophical Review*, 78: 147-77.
- GRUBER, F.A. & S.J. SEGALOWITZ (1977) Some issues & methods in the neuropsychology of language. In S.J. Segalowitz & F.A. Gruber (eds.) *Language Development & Neurological Theory*. 3-19. New York: Academic Press.
- HAMANN, J.G. (1762) *Schriften*. Berlin: G. Reimer.
- _____(1949-1957) *Sämtliche Werke*. 5 volumes. Vienna: Verlag Herder.
- _____(1955-1979) *Briefwechsel*. 7 volumes. Wiesbaden: Insel Verlag.
- HEESCHEN, V. (1977) Weltanschauung – Reflexionen über einen Begriff Wilhelm von Humboldts. *Historiographia Linguistica*, 4: 159-90.
- HERDER, J.G. von (1777-1913) *Sämtliche Werke*. 33 volumes. Berlin: Weidemann.
- HEYNICK, F. (1983) From Einstein to Whorf: Space, time, matter, and reference frames in physical and linguistic relativity. *Semiotica*, 45 (1/2): 35-64.
- HILL, J.H. (1988) Language, culture, & world view. In F.J. Newmeyer (ed.) *Linguistics: The Cambridge Survey, vol. IV: Language: The Socio-cultural Context*. 14-36. Cambridge: Cambridge University Press.
- HILL, J.H. & B. MANHEIM (1992) Language & world view. *Annual Review of Anthropology*, 21: 381-406.
- HOIJER, H. (1948) Linguistic & cultural change. *Language*, 24: 355-45.
- _____(1951) Cultural implications of some Navaho linguistic categories. *Language*, 27: 111-20.
- _____(1953) The relation of language to culture. In A.L. Kroeber (ed.) *Anthropology Today*. 554-73. Chicago: University of Chicago Press.
- _____(1954) The Sapir-Whorf hypothesis. In H. Hoijer (ed.) *Language in Culture*. 92-105. Chicago: University of Chicago Press.
- HOWITT, D. & D. CRAMER (2000) *First Steps in Research & Statistics*. London: Routledge.
- HUMBOLDT, W.von (1903-36) *Gesammelte Schriften*. Berlin: Behr.
- _____(1963) *Humanist Without Portfolio: An Anthology to the Writings of Wilhelm von Humboldt*. Detroit: Wayne State University Press.
- _____(1988) *On Language: The Diversity of Human Language-Structure & its Influence on the Mental Development of Mankind*. Cambridge: Cambridge University Press.
- _____(1999) *On Language: On the Diversity of Human Language Construction & its Influence on the Mental Development of the Human Species*. Cambridge: Cambridge University Press.
- HUME, D. (1874-1875) *Works*. London: Longman.
- HYMES, D.H. (1961) On typology of cognitive styles in language (with examples from Chinookan). *Anthropological Linguistics*, 3 (1): 22-54.

- ____ (1962) The ethnography of speaking. In T. Gladwin and W.C. Sturtevant (eds.) *Anthropology & Human Behaviour*. 13-54. Washington: Anthropological Society of Washington.
- ____ (1966) Two types of linguistic relativity. In W. Bright (ed.) *Sociolinguistics*. 114-57. The Hague: Mouton.
- JACKENDOFF, R. (1983) *Semantics & Cognition*. Cambridge, MA: MIT Press.
- ____ (1992) *Languages of the Mind*. Cambridge, MA: MIT Press.
- JAKOBSON, R. (1959) Boas' view of grammatical meaning. *American Anthropologist*, 61: 139-45.
- JOHNSON, M. (1987) *The Body in the Mind*. Chicago: University of Chicago Press.
- JOSEPH, J.E. (1996) The immediate sources of the 'Sapir-Whorf Hypothesis'. *Historiographia Linguistica*, 23(3): 365-404.
- JUNG, C. (1923) *Psychological Types: Or the Psychology of Individuation*. London: Routledge.
- KANT, I. (1892) *Critique of Judgement*. London: MacMillan Press.
- ____ (1956) *Critique of Pure Reason*. London: MacMillan Press.
- KAY, P. & W. KEMPTON (1984) What is the Sapir-Whorf hypothesis? *American Anthropologist*, 86: 65-79.
- KEESING, R.M. (1992) Anthropology and linguistics. In M. Pütz (ed.) *Thirty Years of Linguistic Evolution*. 593-609. Amsterdam: John Benjamins.
- KINTSCH, W. (1988) The role of knowledge in discourse comprehension: a construction-integration model. *Psychological Review*, 95: 163-182.
- KITA, S. (2004) Speech accompanying gestures as a window into event conceptualisation at the moment of speaking in adults and children. Conference presentation, Language, Culture & Mind, Portsmouth, 20.07.04.
- KOERNER, E.F.K. (2000) Towards a 'full pedigree' of the 'Sapir-Whorf Hypothesis'. In M. Pütz & M. Verspoor (eds.) *Explorations in Linguistic Relativity*. 1-23. Amsterdam: John Benjamins.
- KOFFKA, K. (1935) *Principles of Gestalt Psychology*. London: Routledge.
- KOPECKA, A. (2004) Étude typologique de l'expression de l'espace: localisation et déplacement en français et en polonais. Unpublished doctoral thesis. Université Lumière Lyon 2, France.
- KOPECKA, A. & S. POURCEL (2005) Figuring out figures' role in motion conceptualisation. Conference presentation, International Cognitive Linguistics Conference, Seoul, Korea, 21.07.05.
- KUCZAJ, S.A., II & J.L. HENDRY (2003) Does language help animals think? In D. Gentner & S. Goldin-Meadow (eds.) *Language in Mind: Advances in the Study of Language & Thought*. 437-75. Cambridge, MA: MIT Press.
- LABOV, W. (1972) *Sociolinguistic Patterns*. Philadelphia: University of Pennsylvania Press.
- LAKOFF, G. (1986) Classifiers as a reflection of the mind. In C. Craig (ed.) *Typological Studies in Language, volume 7, Noun Classes & Categorisation*. 13-51. Amsterdam: Benjamins.

- _____. (1987) *Women, Fire & dangerous Things: What Categories Reveal About the Mind*. Chicago: University of Chicago Press.
- LAKOFF, G. & M. JOHNSON (1980) *Metaphors We Live By*. Chicago: University of Chicago Press.
- LANGACKER, R. (1976) Semantic representations and the linguistic relativity hypothesis. *Foundations of Language*, 14: 307-57.
- _____. (1987) *Foundations of Cognitive Grammar: Theoretical Prerequisites*. Volume 1. Stanford, CA: Stanford University Press.
- _____. (1991) *Concept, Image, & Symbol: The Cognitive Basis of Grammar*. Berlin: Mouton de Gruyter.
- _____. (1994) Culture, cognition, and grammar. In M. Pütz (ed.) *Language Contact and Language Conflict*. 25-53. Amsterdam: Benjamins.
- LAWRENCE, D.H. (1924) *England, My England*. London: Martin Secker.
- LEACH, J. (1991) *Running Applied Psychology Experiments*. Buckingham, UK: Open University Press.
- LEE, B. (1993) Metalanguages & subjectivities. In J. Lucy (ed.) *Reflexive Language*. 365-92. Cambridge: Cambridge University Press.
- _____. (1997) *Talking Heads*. Durham, N. Carolina: Duke University Press.
- LEE, D. (1940a) Noun categories in Wintu. *Zeitschrift für Vergleichende Sprachforschung*, 67: 197-210.
- _____. (1940b) The place of kinship terms in Wintu speech. *American Anthropologist*, 42: 604-16.
- _____. (1944) Categories of the generic & the particular in Wintu. *American Anthropologist*, 46: 362-69.
- _____. (1950) The conception of the self among the Wintu Indians. *Journal of Abnormal and Social Psychology*, 45: 538-43.
- _____. (1959) Linguistic reflection of Wintu thought. In D. Lee (ed.) *Freedom and Culture*. 21-30. Englewood Cliffs, NJ: Prentice-Hall.
- LEE, P. (1994) New work on the linguistic relativity question. *Historiographia Linguistica*, 21 (1/2): 173-91.
- _____. (1996) *The Whorf Theory Complex*. Amsterdam: John Benjamins.
- _____. (2000) When is 'linguistic relativity' Whorf's linguistic relativity? In M. Pütz & M. Verspoor (eds.) *Explorations in Linguistic Relativity*. 45-67. Amsterdam: John Benjamins.
- LEIBNITZ, G.W. (1697) *Deutsche Schriften*. Berlin: Veit & Comp.
- LENNEBERG, E.H. (1953) Cognition in ethnolinguistics. *Language*, 29: 463-71.
- LENNEBERG, E.H. & J.M. ROBERTS (1956) The language of experience: a study in methodology. *International Journal of American Linguistics*, 22 (2, part 2, Memoir 13).
- LEVINSON, S.C. (1996) Universals and variation in language and culture: Introduction. In J.J. Gumperz & S.C. Levinson (eds.) *Rethinking Linguistic Relativity*. 133-44. Cambridge: Cambridge University Press.

- ____ (1997) From outer to inner space: linguistic categories and non-linguistic thinking. In J. Nuyts & E. Pederson (eds.) *Language and Conceptualisation*. 13-45. Cambridge: Cambridge University Press.
- ____ (2003) *Space in Language & Cognition*. Cambridge: Cambridge University Press.
- LOCKE, J. (1823) *Works*. Oxford: Clarendon.
- LUCRETIUS, T. (1957) *On the Nature of Things*. New York: E.P. Dutton.
- LUCY, J.A. (1985) Whorf's view of the linguistic mediation of thought. In E. Mertz & R.J. Parmentier (eds.) *Semiotic Mediation: Sociocultural & Psychological Perspectives*. 73-97. Orlando, FL: Academic Press.
- ____ (1992a) *Language Diversity & Thought*. Cambridge: Cambridge University Press.
- ____ (1992b) *Grammatical Categories & Cognition*. Cambridge: Cambridge University Press.
- ____ (1996) The scope of linguistic relativity: An analysis and review of empirical research. In J.J. Gumperz & S.C. Levinson (eds.) *Rethinking Linguistic Relativity*. 37-69. Cambridge: Cambridge University Press.
- ____ (1997a) The linguistics of "color". In C.L. Hardin & L. Maffin (eds.) *Color Categories in Thought & Language*. 320-46. Cambridge: Cambridge University Press.
- ____ (1997b) Linguistic relativity. *Annual Review of Anthropology*, 26: 291-312.
- ____ (2003) Semantic accent & linguistic relativity. Draft.
- LUCY, J.A. & S. GASKINS (2003) Interaction of language type and referent type in the development of nonverbal classification preferences. From D. Gentner & S. Goldin-Meadow (eds.) *Language in Mind: Advances in the Study of Language & Thought*. 465-92. Cambridge, MA: MIT Press.
- LUCY, J.A. & R.A. SHWEDER (1979) Whorf & his critics: Linguistic & non-linguistic influences on colour memory. *American Anthropologist*, 81: 581-615.
- MACLAURY, R. (1986) *Colour Categories in Mesoamerican: A Cross-linguistic Study*. Ph.D. Dissertation: University of California, Berkeley.
- MACLAY, M. (1958) An experimental study of language and non-linguistic behaviour. *Southwestern Journal of Anthropology*, 14: 220-9.
- MAJID, A., VAN STADEN, M. & N. ENFIELD (2004) The image-schema & cross-linguistic differences in body-part terms. Conference presentation, EMCL Workshop: Image-schemas & Linguistic Relativity, Portsmouth, 18.07.04.
- MALINOWSKI, B. (1922) *Argonauts of the Western Pacific*. New York: Dutton.
- ____ (1923) The Problem of meaning in primitive languages. In Ogden, C.K. & I.A. Richards (eds.) *The Meaning of Meaning: A Study of the Influence of Language upon Thought & of the Science of Symbolism*. 296-336. London: Routledge.
- MANDELBAUM, D.G. (1985) Editor's introduction. In D.G. Mandelbaum (ed.) *Selected Writings of Edward Sapir in Language, Culture & Personality*. v-xii. Berkeley: University of California Press.
- MATHIOT, M. (1962) Noun classes and folk taxonomy in Papago. *American Anthropologist*, 64: 340-50.

- _____(1967) The cognitive significance of the category of nominal number in Papago. In D.H. Hymes & W. Bittle (eds.) *Studies in Southwestern Ethnolinguistics*. 197-237. The Hague: Mouton.
- _____(1968) An approach to the cognitive study of language. *International Journal of American Linguistics*, 34 (1, part 2).
- _____(1969) The semantic & cognitive domains of language. In P.L. Garvin (ed.) *Cognition: A Multiple View*. 249-76. New York: Spartan Books.
- MAYER, M. (1969) *Frog, Where Are You?* New York: Dial Press.
- MILLER, G.A. (1956) The magical number seven, plus or minus two: some limits on our capacity for processing information. *Psychological Review*, 63 (2): 81-97.
- MONBODDO, J.B. (1774-1792) *Of the Origin and Progress of Language*. London: Balfour & Cadell.
- MUELLER-VOLLMER, K. (1990) From sign to signification: The Herder-Humboldt controversy. In W. Koepke (ed.) *Johann Gottfried Herder*. 9-24. Columbia, SC: Camden House.
- NAIGLES, L., A. EISENBERG, E. KAKO, M. HIGHTER & N. MCGRAW (1998) Speaking of motion: Verb use in English & Spanish. *Language & Cognitive Processes*, 13: 521-49.
- NAIGLES L. & P. TERRAZAS (1998) Motion-verb generalisations in English & Spanish: Influences of language & syntax. *Psychological Review*, 9 (5): 363-69.
- OGDEN, C.K. & I.A. RICHARDS (1923) *The Meaning of Meaning: A Study of the Influence of Language upon Thought & of the Science of Symbolism*. London: Routledge.
- PALMER, G.B. (1996) *Toward a Theory of Cultural Linguistics*. Austin: University of Texas Press.
- PAPAFRAGOU, A., C. MASSEY & L. GLEITMAN (2002) Shake, rattle, 'n' roll: the representation of motion in language & cognition. *Cognition*, 84: 189-219.
- PINKER, S. (1989) *Learnability & Cognition: The Acquisition of Argument Structure*. Cambridge, MA: MIT Press.
- _____(1994) *The Language Instinct: How the Mind Creates Language*. London: Penguin.
- POWELL, J.W. (1877) *Introduction to the Study of Indian Languages with Words, Phrases, & Sentences to be Collected*. Washington, DC: Government Printing Office.
- PUTNAM, H. (1988) *Representation & Reality*. Cambridge, MA: MIT Press.
- ROUSSEAU, J-J. (1823-1826) *Oeuvres complètes*. Paris: P. Dupont.
- _____(1987) *The Social Contract & Discourse on the Origin of Inequality*. London: Penguin.
- SAID, E. (1985) *Orientalism*. Harmondsworth: Penguin.
- SAPIR, E. (1907) Herder's "Ursprung der Sprache." *Modern Philology*, 5: 109-42.
- _____(1912) Language & environment. *American Anthropologist*, 14: 226-42.
- _____(1921) *Language*. New York: Harcourt, Brace & Co.
- _____(1964) Conceptual categories in primitive languages. In D.H. Hymes (ed.) *Language in Culture & Society: A Reader in Linguistics & Anthropology*. 128. New York: Harper & Row.

- ____ (1985) *Selected Writings in Language, Culture & Personality*. Berkeley: University of California Press.
- ____ (1994) *The Psychology of Culture: A Course of Lectures*. Berlin: Mouton de Gruyter.
- SAPIR, E. & M. SWADESH (1964) American Indian grammatical categories. In D.H. Hymes (ed.) *Language in Culture & Society: A Reader in Linguistics & Anthropology*. 101-7. New York: Harper & Row.
- SAUSSURE, F. de (1916) *Cours de linguistique générale*. Paris: Payot.
- SCHULTZE-BERNDT, E. (2000) *Simple & Complex Verbs in Jaminjung: A Study of Event Categorisation in an Australian Language*. MPI Series in Psycholinguistics, 14. Wageningen, NL: Ponsen & Looijen.
- SILVERSTEIN, M. (1974) Dialectical developments in Chinookan tense-aspect systems. *International Journal of American Linguistics*, 40 (4, part 2, memoir 28).
- ____ (1976a) Hierarchy of features & ergativity. In R.M.W. Dixon (ed.) *Grammatical Categories in Australian Languages*. 112-71. Canberra: Australian Institute of Aboriginal Studies.
- ____ (1976b) Shifters, linguistic categories, & cultural description. In K. Basso & H. Selby (eds.) *Meaning in Anthropology*. 11-55. Albuquerque: University of New Mexico Press.
- ____ (1979) Language structure & linguistic ideology. In P. Clyne, W. Hanks, & C. Hofbauer (eds.) *The Elements: A Parasession on Linguistic Units & Levels*. 193-247. Chicago: Chicago Linguistics Society.
- ____ (1980) Cognitive implications of a referential hierarchy. Paper presented at the Max-Planck-Institut für Psycholinguistik, Nijmegen, the Netherlands.
- ____ (1981a) Case-marking & the nature of language. *Australian Journal of Linguistics*, 1: 227-44.
- ____ (1981b) The limits of awareness. *Working Papers in Sociolinguistics*, 84. Austin: Southwestern Educational Laboratory.
- ____ (1985) Language & the culture of gender: at the intersection of structure, usage, & ideology. In E. Mertz & R.J. Parmentier (eds.) *Semiotic Mediation: Sociocultural & Psychological Perspectives*. 219-59. Orlando, FL: Academic Press.
- ____ (1987) Cognitive implications of a referential hierarchy. In M. Hickman (ed.) *Social and Functional Approaches to Language & Thought*. 125-64. Cambridge: Cambridge University Press.
- SINHA, C. (1988) *Language & Representation: A Socio-Naturalistic Approach to Human Development*. New York: New York University Press.
- SLOBIN, D.I. (1987) Thinking for speaking. *Proceedings of the Thirteenth Annual Meeting of the Berkeley Linguistics Society*: 435-44.
- ____ (1991) Learning to think for speaking: native language, cognition, & rhetorical style. *Pragmatics*, 1: 7-26.
- ____ (1996a) From 'thought & language' to 'thinking for speaking'. In J.J. Gumperz & S.C. Levinson (eds.) *Rethinking Linguistic Relativity*. 70-96. Cambridge: Cambridge University Press.

- ____ (1996b) Two ways to travel: verbs of motion in English & Spanish. In M. Shibatani & S.A. Thompson (eds.) *Grammatical Constructions: Their Form & Meaning*. 195-219. Oxford: Clarendon Press.
- ____ (1997) Mind, code, & text. In J. Bybee, J. Haiman & S.A. Thompson (eds.) *Essays on Language Function & Language Type*. 437-67. Amsterdam: John Benjamins.
- ____ (2000) Verbalised events: a dynamic approach to linguistic relativity & determinism. In S. Niemeier & R. Dirven (eds.) *Evidence for Linguistic Relativity*. 107-38. Amsterdam: John Benjamins.
- ____ (2003a) Language & thought online: cognitive consequences of linguistic relativity. In D. Gentner & S. Goldin-Meadow (eds.) *Language in Mind: Advances in the Investigation of Language & Thought*. 157-91. Cambridge, MA: MIT Press.
- ____ (2003b) What makes manner of motion salient? Conference presentation, Space in Languages: Linguistic Systems & Cognitive Categories, Paris, 08.02.03. <http://ihd.berkeley.edu>.
- ____ (2004) The many ways to search for a frog: linguistic typology & the expression of motion events. In S. Strömquist & L. Verhoeven (eds.) *Relating Events in Narrative: Typological & Contextual Perspectives*. Volume 2: 219-57. Mahwah, NJ: LEA Publishers.
- SLOBIN, D.I. & N. HOITING (1994) Reference to movement in spoken & signed languages: typological considerations. *Proceedings of the Twentieth Annual Meeting of the Berkeley Linguistics Society*: 487-505.
- SPRADLEY, J. (1980) *Participant Observation*. Orlando, FL: Harcourt Brace Jovanovich Inc.
- STEINER, G. (1992) *After Babel*. Oxford: Oxford University Press.
- STREITBERG, W. (1909) Kant und die Sprachwissenschaft: Eine historische Skizze. *Indogermanische Forschungen*, 26: 382-422.
- TALMY, L. (1983) How language structures space. In H.L. Pick & L.P. Acredolo (eds.) *Spatial Orientation: Theory, Research & Application*. 225-82. New York: Plenum Press.
- ____ (1985) Lexicalisation patterns: semantic structure in lexical forms. In T. Shopen (ed.) *Language Typology & Syntactic Description*, volume 3: 57-149. Cambridge: Cambridge University Press.
- ____ (1988) The relation of grammar to cognition. In B. Rudzka-Ostyn (ed.) *Topics in Cognitive Linguistics*. 165-205. Amsterdam: John Benjamins.
- ____ (1991) Path to realisation: a typology of event conflation. *Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistics Society*: 480-520.
- ____ (2000a) *Toward a Cognitive Semantics: Concept Structuring Systems*, volume 1. Cambridge, MA: MIT Press.
- ____ (2000b) *Toward a Cognitive Semantics: Typology & Process in Concept Structuring*, volumes 2. Cambridge, MA: MIT Press.
- THOMPSON, R.K.R., D.L. ODEN & S.T. BOYSEN (1997) Language-naïve chimpanzees judge relations between relations in a conceptual matching-to-sample task. *Journal of Experimental Psychology: Animal Behaviour Processes*, 23: 31-43.
- TOLKIEN, J.R.R. (1937/1973) *The Hobbit or There & Back Again*. New York: Ballantine.

- TOMASELLO, M. (1998) Cognitive linguistics. In W. Bechtel & G. Graham (eds.) *A Companion to Cognitive Science*. 477-87. Oxford: Oxford University Press.
- TRAGER, G.L. (1942) Benjamin Lee Whorf [obituary]. *Language*, 18.305.
- TRAUGOTT, E. (1988) Pragmatic strengthening & grammaticalisation. *Proceedings of the Fourteenth Annual Meeting of the Berkeley Linguistics Society*: 406-16.
- TYLER, M. & M. SPIVEY (2001) Spoken language comprehension improves the efficiency of visual search. *Proceedings of the Twenty-Third Annual Conference of the Cognitive Science Society*: 1060-5.
- TYLER, S.A. (1969) *Cognitive Anthropology*. New York: Holt, Rinehart & Winston.
- VICO, G. (1961) *New Science*. New York: Doubleday.
- VINAY, J.P. & J. DALBERNET (1958) *Stylistique comparée du français et de l'anglais: méthode de traduction*. London: Harrap.
- VYGOTSKY, L.S. (1978) *Mind in Society: The Development of Higher Mental Processes*. Cambridge, MA: MIT Press.
- ____ (1986) *Thought & Language*. Cambridge, MA: MIT Press.
- WHITNEY, W.D. (1875) *The Life & Growth of Language*. New York: Appleton & Co.
- WHORF, B.L. (1956) *Language, Thought, & Reality*. Cambridge, MA: MIT Press.
- WHORF, B.L. & G.L. TRAGER (1938) *Report on Linguistic Research in the Department of Anthropology of Yale University for the Term Sept. 1937 to June 1938*. Unpublished writings contained in microfilm reels in the University of Yale and in the University of Chicago.
- ZLATEV, J. & C. DAVID (2003) Manner vs. path in the language and cognition of Swedish & French speakers. Conference Presentation, Language, Culture, & Cognition, Braga, Portugal, 18.07.03.
- ZLATEV, J. & C. DAVID (2004a) Three ways to travel: motion events in French, Swedish & Thai. In A. Soares da Silva, A. Torres & M. Gonçalves (eds.) *Linguagem, Cultura e Cognição: Estudos de Linguística Cognitiva*. Volume 2: 119-42. Coimbra: Almedina.
- ZLATEV, J. & C. DAVID (2004b) Do Swedes & Frenchmen view motion differently? Conference Presentation, Language, Culture, & Mind, Portsmouth, 20.07.04.
- ZLATEV, J. & P. YANGKLING (2004) A third way to travel: the place of Thai & serial verb languages in motion event typology. In S. Strömquist & L. Verhoeven (eds.) *Relating Events in Narrative: Typological & Contextual Perspectives*. Volume 2: 447-94. Mahwah, NJ: LEA Publishers.

DICTIONARIES

Le Robert & Collins Senior: Dictionnaire français-anglais, anglais-français (1993). Paris: Dictionnaires Le Robert.

PRESS

- New Scientist*, 30 November. (2002) You are what you speak.
- New Scientist*, 31 January. (2004) For want of a word.

New Scientist, 24 July. (2004) The concepts are there even if the words aren't.

Science Express, 19 August. (2004) Numerical cognition without word: Evidence from Amazonia.

Scientific American, 25 March. (2002) A way with words: Do languages help mold the way we think? A controversial idea from the 1930s is getting a second look.

Scientific American, 22 March. (2004) Draining the language out of colour.

The Economist, 8 January. (2004) Babel's children.

The Japan Times, 9 October. (2003) Language seen limiting the gestures of Japanese, but not Brits.

